SYSTEMS SOFTWARE SUPPORT ISSUES

WESTERN EUROPEAN CUSTOMER SERVICES

1991-1996

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SYSTEMS SOFTWARE SUPPORT ISSUES IN WESTERN EUROPEAN CUSTOMER SERVICES

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Customer Services Programme—Europe

Systems Software Support Issues In
Western European Customer Services,
1991-1996

Abstract

This report analyses the major issues related to systems software support within the Western European customer services market. The issues discussed have been derived from interviews with both users and vendors and data used in the report is drawn from four years of user research covering the years from 1987 to 1990.

The major issues identified include:-

· The bundling of software support
· Software support skills
· Documentation
· The provision of system software updates

The report provides a market forecast for systems software support, discusses the issues of concern to the user and makes a series of recommendations to vendors.

Table of Contents

List of Exhibits

IV   Bundling Issues

V   Skills Issues

I

Introduction

I Introduction

A
Objectives

The objectives of this study are:

- To provide a forecast for the growth in the Western European customer services systems software support market from 1991-1996.

- To identify the major issues influencing the development of the market.

- To outline a number of possible strategies and tactics to adopt in response to the issues raised.

B
Methodology

The data presented in this report is compiled from the following sources:

- The surveys of computer users conducted by INPUT between 1987 and 1990 which cumulatively total over 5000 interviews.

- Thirty in-depth interviews were conducted with computer users to gain qualitative information to support the data drawn from the user surveys.

- Interviews were conducted with 6 of the major Western European equipment vendors to enhance the understanding of the current developments in the supply of systems software support within the customer services market.

C
Definitions and Data Interpretation

INPUT divides Systems Software into 3 categories:

- Application development tools

- Operations management tools

- Systems Control Software

The constituent elements of the 3 categories are listed in Exhibit I-1. This report only considers the support of operations management tools and systems control software which are defined as being the responsibility of customer services.

EXHIBIT I-1

Systems Software Products
Market Structure

```
                    ┌─────────────────┐
                    │    Systems      │
                    │    Software     │
                    └─────────────────┘
```

Systems Control	Operations Management Tools	Applications Development Tools

Program Development and Production Tools

Systems Control
- Access Control
- Communications Monitors
- Micro-Mainframe Links
- Network Control
- Operating Systems
- Security Systems
- System Library Control
- Windowing Systems
- Other

Operations Management Tools
- Capacity Management
- Computer Operations Scheduling
- Data Center Management
- Disk Management
- Downtime/Repair Monitoring Management
- Job Accounting
- Performance Monitors
- Tape Management
- Utilities
- Other

Applications Development Tools / Program Development and Production Tools
- Applications Generators
- Assemblers
- Automatic Documentation
- Configuration Management
- Debugging Aids
- Languages (All Generations)
- Systems Development Control
- Retrieval Systems
- Translators
- 4GL
- I-CASE
- Other

Customer Services—Systems Software Support

Data Base Management Systems
- Data Base Management Systems
- Data Dictionaries
- Other

CE-SW1

Importance ratings are measured on a scale of 0-10 and are defined as follows:

- 0 = of no importance whatsoever
- 5 = of average importance
- 10 = extremely important

The satisfaction index (SI) is derived from the difference between user importance and satisfaction ratings. User satisfaction ratings are defined as follows:

- 0 = totally and absolutely dissatisfied
- 5 = average satisfaction
- 10 = totally satisfied

The satisfaction index (SI) is defined as:

- (1) = over fulfilled or over satisfied
- 0 = completely satisfied
- 1 = concerns and worries
- 2 = real dissatisfaction
- 3 = pain level

Standard error is used to indicate the degree of uncertainty between the sample mean and the total population mean. It is calculated by dividing the standard deviation (SD) of the sample by the square root of the sample size.

D
Report Structure

- Section II is the Executive Overview presenting the principal findings of the report.

- Section III includes the market forecast and a detailed description of the market.

- Section IV contains an analysis of current developments in the adoption of support bundling strategies.

- Section V analyses the major issues relating to systems software support skills.

- Section VI analyses the major issues relating to systems software documentation.

- Section VII analyses the major issues relating to the provision of systems software updates.

- Appendix A contains the in-depth user questionnaire.

- Appendix B contains the vendor questionnaire.

II
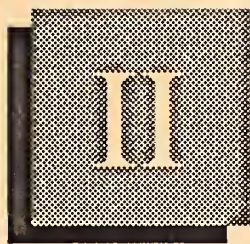
Executive Overview

II Executive Overview

A
User Satisfaction - Long Running Decline to Position of Concern

User satisfaction with systems software support shows a long running decline over the four years to 1990 and is now at a point where users are expressing real concerns and worries with the quality of support they receive. The major causes of dissatisfaction are as follows:-

· Support Skills
· Documentation
· The Provision of Software Updates

The systems software support market is forecast to grow at a compound annual growth rate of 15% between 1991 and 1996. However, the increase in the adoption of industry standard software provides a potential opportunity for professional services companies to enter the market. Therefore, the degree to which equipment vendors will be able to take advantage of the growth potential in the face of increased competition will, to a large extent, be dependent upon their ability to respond to the needs of the customer.

The principal findings from the study are summarised in Exhibit II-1.

Exhibit II-1

Systems Software Support Major Issues

- The market will grow at a CAGR of 15%, 1991-1996
- Customer satisfaction with systems software shows a degree of worry and concern
- A clear move to unbundled support has not been identified
- The principal areas of concern identified by users are
  - Support skills
  - Documentation
  - The provision of software updates

The factors driving the growth of the market for the equipment vendor can be considered as follows:-

· The increasing complexity of the systems software platform.

· The fact that up to 80% of users are unwilling to contract the support of systems software to independent maintenance companies.

· Declining growth in the hardware maintenance sector is causing vendors to continue to attack the growth sectors within the market.

The major inhibitors are as follows:-

· The uncertain economic outlook in Europe.

· The application of strict business investment criteria to IT projects.

· The bundling of software support revenues into the software licence fee.

· The growth of standard operating systems such as UNIX potentially increasing the level of competition.

The issue of the provision of bundled or unbundled support has a significant impact on the future growth of software support revenues. The existence of a wide variety of factors encouraging the adoption of both bundled and unbundled support strategies effectively negates the possibility of identifying a clear trend towards either option.

However, it is estimated that the strongest influence on the issue is the need to develop revenue from alternative service products. It is, therefore, concluded that vendors will gradually move towards the unbundling of support.

Research indicates that a degree of concern exists within the user community with the quality of service received. The principal areas of concern are:-

· The provision of systems software updates. Concern is expressed at the failure of equipment suppliers to keep customers informed of the availability of software updates and to deliver new releases in a timely fashion.

· Systems software support skills. Users are dissatisfied with both the lack of software skills of field engineering personnel and the inaccessibility of the appropriate level of expertise.

· Documentation. The principal issues of concern are:-

- Difficulties of comprehension caused by excessive bulk and the lack of translations into Continental European languages.

- The failure to maintain documentation at the same release level as the software it is intended to support.

- A lack of technical depth.

Although a number of tactics can be employed to address the issues raised, such as the adoption of CD-ROM as a distribution tool, the principal conclusion to be drawn from the study is that there are a number of important areas in which the quality of account management is failing to meet the needs of the customer. It is expected that new entrants will attempt to compete for a share of the anticipated growth in the market. If equipment vendors are to benefit from this growth, they will need to place increased focus on satisfying the requirements of the customer.

B
The Market

Exhibit II-2 shows the estimated rate of growth in the market between 1987 and 1996. It will be noted that the compound annual growth rate of approximately 15% is approaching three times the overall European rate of inflation which is estimated at 6%. Although significant real growth will occur, it is expected that the rate will decline marginally from a CAGR of approximately 16% experienced during the late 1980's.

The major drivers and inhibitors which are expected to influence the market during the first half of the decade are summarised in Exhibit II-3.

1. The Drivers

The factors driving the growth of the market can be considered as follows:-

· The increasing complexity of systems software platforms, caused by such factors as the growth in networked computer installations, will lead to increased demand for systems support services.

· Users are proving to be unwilling to contract the support of systems software to independent maintenance vendors. It is predicted that equipment vendors will maintain a market share of greater than 80%. The lack of competition posed by the independent sector will allow equipment vendors to continue to levy price increases over and above the rate of inflation, thereby expanding the revenue growth of the market.

· The continuing decline of the growth in the hardware maintenance sector is leading vendors to continue to attack the growth sectors within the market. This factor will therefore continue to push the growth of the software support product.

III - C - II - 4   CE-SW1

2. The Inhibitors

The five factors expected to inhibit the growth of the market are considered below:-

- The uncertain economic outlook in Europe will continue to affect the growth of the IT market in general and will therefore have an obvious impact on the growth of services.

- It is anticipated that strict business investment criteria will increasingly dictate the pattern of IT spend within the end-user community, as opposed to the reliance placed upon the judgement of technical staff which has largely characterised investment decisions up to this point in time. Such a trend will potentially affect the rate of growth within the IT industry generally with a consequent impact on systems software support.

- The bundling of software support revenues into the software licence fee will continue to have a potential effect on the revenues generated by the systems software support stream. A degree of confusion still exists within both the user and vendor communities over the advantages of bundled or unbundled support. The potential therefore remains for the bundling issue to serve as a significant factor influencing the flow of revenues through the systems support stream.

- The growth of standard operating systems such as UNIX will potentially increase the level of competition in the market as vendors increasingly lose the protection afforded by proprietary systems. This factor implies that the growth of open systems will have an affect on the future growth within the market.

- A number of opportunities exist for Professional Services vendors which will potentially allow them to attack the market. They have highly developed software skills which can be utilised within the systems support arena. Software products are being developed to assist in the management of the systems platform which give vendors a presence in the market. Finally, the entry of Professional Services vendors into the systems operations marketplace provides them with the opportunity to include systems support within a systems operations contract.

The expectation that the systems support market will continue to exhibit real growth implies that the drivers will provide a stronger influence than the inhibitors. However, issues such as the macro-economic climate and the degree to which professional services companies will move into the market obviously have a strong potential influence.

Exhibit II-2

The Estimated Growth of the Western European Systems Software Support Market, 1987-1996
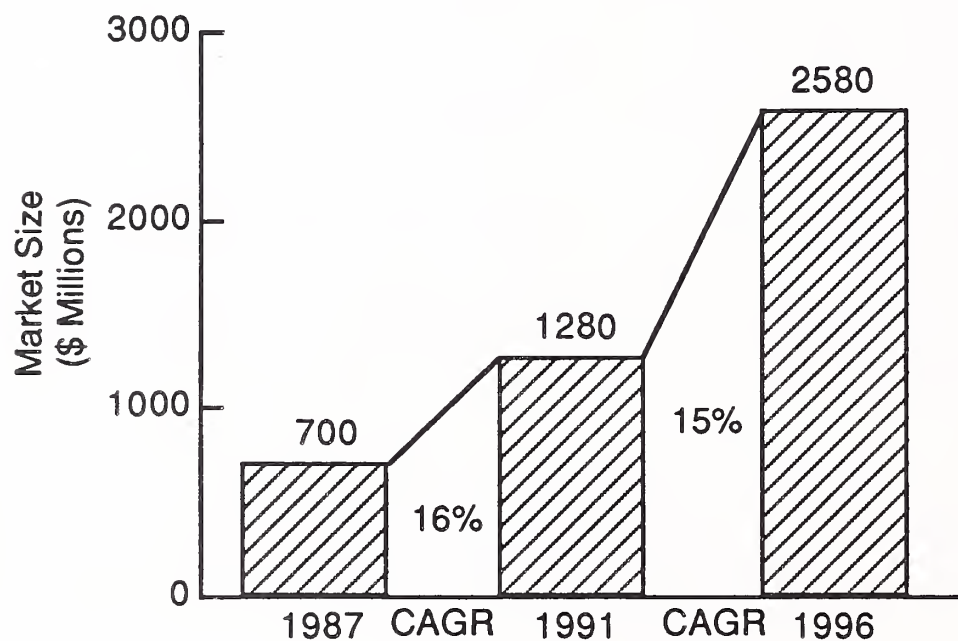
All figures are INPUT estimates

     CE-SW1

Exhibit II-3

Systems Software Support Market Growth
Drivers and Inhibitors

Inhibitors	Drivers
Uncertain economic outlook Application of strict investment criteria to IT spending proposals The bundling issue Increasing penetration of industry standard operating systems Increased opportunities for professional services vendors	Increased demand for support services arising from increasing software complexity Resistance to contracting out support to third party vendors Continued decline of hardware maintenance market necessitating development of alternative markets

C
Customer Satisfaction

Exhibit II-4 shows the overall trends in customer attitudes towards systems software over the four year period to 1990. The average importance rating of 8.3 indicates the level of importance, measured on a scale of 0-10, that would be expected for a service as important as systems software support. Despite the improvement in the satisfaction rating in 1988, the satisfaction index generally indicates that a degree of concern exists within the user community at the quality of service that they receive. Although there is no evidence of a worsening trend, no grounds exist for assuming that the situation is improving

The satisfaction data for the constituent elements of the systems software support service are analysed in Exhibit II-5, which clearly indicates the principal areas of concern.

Exhibit II-4

Trends in Overall Software Support Performance Western Europe, 1987-1990

Importance Rating
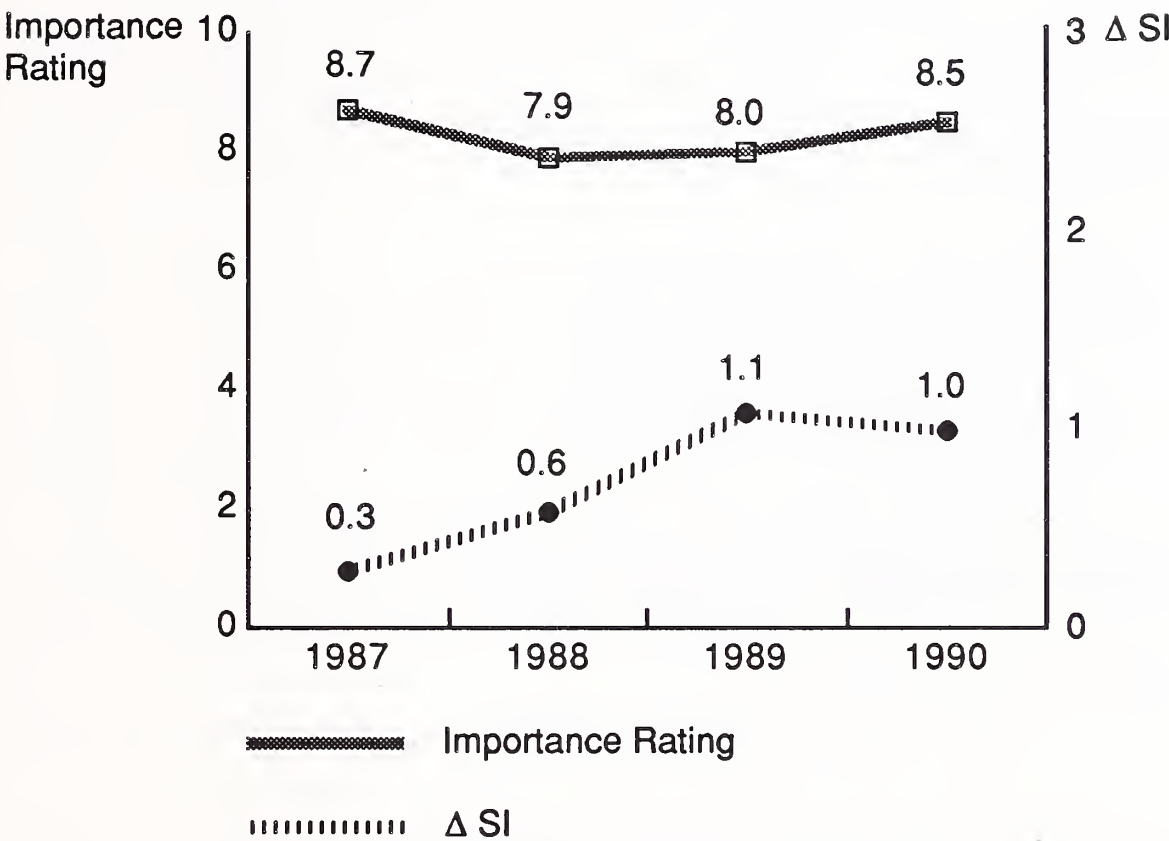
Sample Size:
1987	1,321
1988	1,593
1989	1,626
1990	1,211

Exhibit II-5

Systems Software Support Satisfaction
Western Europe 1990

Service Aspect	Importance	Satisfaction	Satisfaction Index ΔSI
Engineer skills	8.9	7.9	1.0
Documentation	8.4	6.9	1.5
Software installation	8.4	7.8	0.6
Provision of updates	8.4	7.4	1.0
Remote diagnostics	8.1	7.3	0.8

Sample Size: 1,211

Standard Error: 0.3

D
The Bundling Issue - No Clear Direction Established

The existence of a wide variety of factors encouraging the adoption of both bundled and unbundled support strategies effectively negates the possibility of identifying a clear trend towards either option. The principal influencing factors are illustrated in Exhibit II-6 and are described below.

The following points support the use of a strategy of bundling software support:-

- Hardware markets in which hardware is, or has historically been, more difficult to maintain than software have tended to encourage the bundling of systems software support. The principal market to which this factor can be applied is the large systems market.

- Plug compatible manufacturers within the large systems market have used the bundling of software support to provide services which add value to the basic service contract for their customers. The principal motive behind this tactic has been to use the service concept in order to develop differential advantage. Competitive edge can be increased by incorporating services into the basic contract which increase the value of the contract to the customer.

- Customers who anticipate cuts in systems budgets have expressed a preference for bundled software support to ensure that a level of support can be maintained during periods of financial uncertainty.

The principal factors in favour of unbundling can be considered as follows:-

- The increasing complexity of systems software and the level of maintenance required to support it, combined with the increased simplicity of the hardware maintenance process, will encourage the consideration of software support as an independent entity.

- The pressure on vendors to establish alternative sources of revenue to compensate for the decline in growth of the hardware maintenance market provides a powerful incentive to unbundle software support, which is expected to be a growth market throughout the first half of the 1990's.

- The importance of software support centres or helplines to the service quality image of the vendor implies the need to ensure that an adequate level of investment is provided. The adoption of an unbundled support programme permits the treatment of software support centres as profit centres, thereby facilitating the introduction of adequate investment criteria under which funds can be provided.

Of these factors, it is estimated that the strongest influence will be generated by the requirement to develop revenue from alternative service products. Although the factors that specifically apply to the large systems market will persist, it is tentatively concluded that vendors will move towards the unbundling of support.

Exhibit II-6

Bundled Support or Unbundled Support?
Factors Influencing the Decision

Technical complexity
of hardware support

Budgetary restrictions
on the customer

The large systems
marketplace

Bundled
Support

Unbundled
Support

Technical complexity
of software support

Pressure to generate
alternative revenue
streams

Customer tendering
requirements

Software support
departments as profit
centres
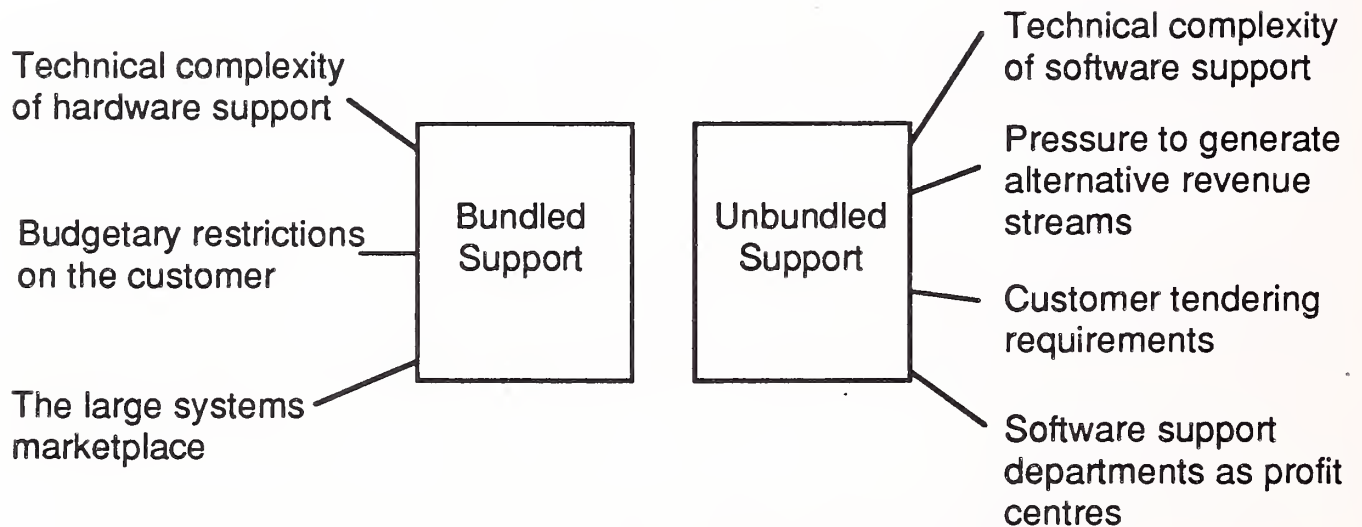
E
The Areas of Customer Concern

In order to gain a detailed picture of the factors contributing towards the areas of user concern, 30 in-depth user interviews were conducted to discuss the major issues. The results of the interviews are analysed in Exhibit II-7 and the principal findings are detailed below.

1. The Provision of Software Updates

The issue of the provision of systems software updates is regarded as being of significant importance by users. It is rated at a level of interest of approximately 8 on a scale of 0-10.

The level of satisfaction generated by the issue has shown a declining trend over the 4 year period to 1990 and is at a level where it is giving cause for concern.

A summary of the factors involved in the provision of software updates is provided in Exhibit II-8. The principal point of concern is the perceived delay experienced by users in receiving both new releases of software and information relating to release status.

The overall conclusion to be drawn from the study is that, in relation to this specific subject area, the quality of account management does not meet the requirements of the customer.

If the declining levels of satisfaction evident in the trend data are to be reversed, vendors should ensure that communication and distribution channels are effective and both widely accepted and understood.

Exhibit II-7

Systems Software Support
Areas of Dissatisfaction

Percentage of Sample
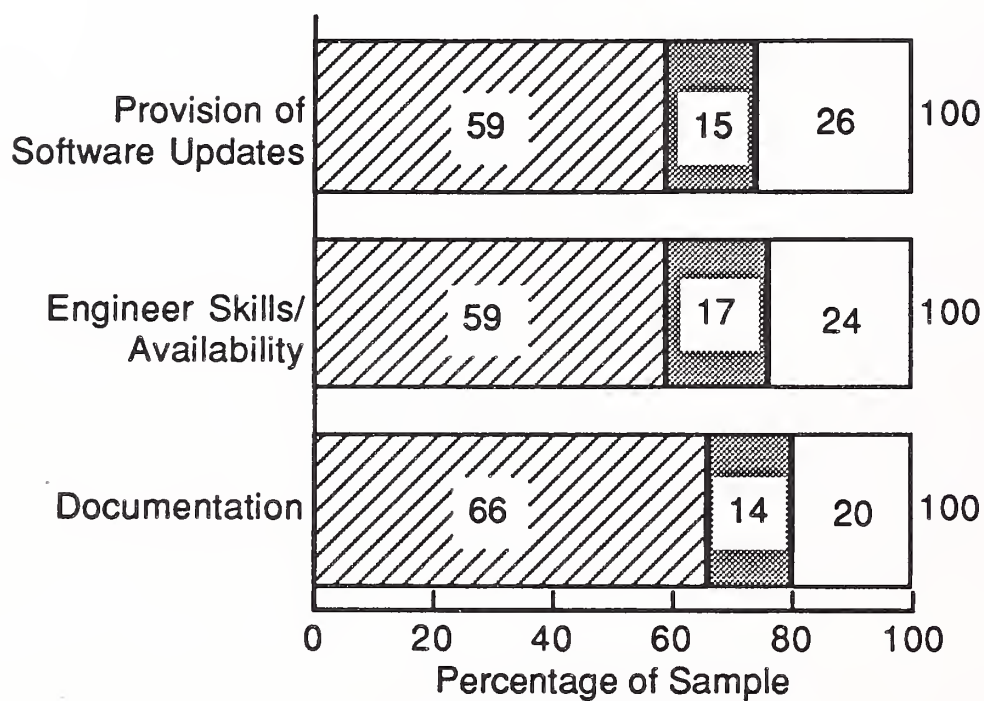
☑ Satisfied

▦ No Comment Made

☐ Dissatisfied

Sample Size: 30

Exhibit II-8

Provision of Systems Software Updates
The Issues

Delayed Information		Delayed Software

Causes

Dissatisfaction

Solution

Account Management
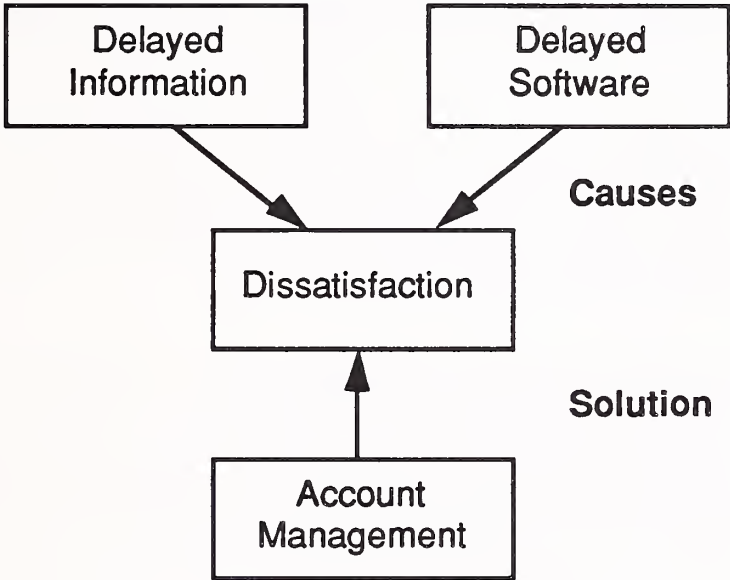
2. The Availability of Engineering Skills

The issue of systems software support skills is regarded as being of very significant importance by users. It is rated at a level of interest of approximately 9 on a scale of 0-10.

The level of satisfaction generated by the issue has shown a declining trend over the 4 year period to 1990 and is at a level where it is giving cause for concern.

The principal factors which have been identified as the major causes of concern are summarised in Exhibit II-9 and are described below:-

- Field engineering personnel do not have adequate systems software support skills. Although customers have a low level of expectation of field software skills, dissatisfaction is generated both because users consequently find adequate software support difficult to find and because there are occasions where users find it necessary to train their vendor's field staff on aspects of software.

- Problems are encountered by users in gaining access to the appropriate level of software support expertise through telephone helpline services. Complaints are made both at the bureaucracy surrounding the fault logging process and the call qualifying stage of the operation. Users also feel that software specialists manning the helplines are too far removed from the commercial realities of the users operation.

- Users of old or obsolete products are dissatisfied at the quality of systems software support available to them. In one particular instance this issue was quoted as one of the factors which persuaded a user to migrate to an alternative hardware supplier.

Two particular courses of action can be considered in order to reduce the dissatisfaction generated by these particular issues.

- A number of vendors are broadening the skills base of their field support personnel to include systems software support capability. By undergoing this process the role of the hardware engineer will evolve into that of a problem manager capable of managing the resolution of the complete range of technical problems. The provision of a point of contact for technical problem solving will reduce the sense of inaccessibility expressed by users. The development of problem management capability will also assist in improving the understanding of the software support requirements of customers, including those using old equipment. Exhibit II-10 illustrates the direction in which the field engineers skills mix should be evolved.

                                       CE-SW1

- Telephone helpline services should become more accessible by reducing the level of bureaucracy encountered in logging calls. Some vendors are moving to a procedure whereby users log their own calls and a telecommunications link is utilised to transmit the fault record to the vendor's service centre. The call can then be directed immediately to the appropriate technical expert who then becomes the first point of contact for the user.

The overall conclusion to be drawn from the comments made by users is that software support capability should be made both more visible and accessible to the user.

Exhibit II-9

Systems Software Support Skills—Principal Causes of Dissatisfaction

Dissatisfaction

Field engineering personnel do not possess sufficient software skills

Office-based software expertise is inaccessible

Decline of vendor expertise on older equipment
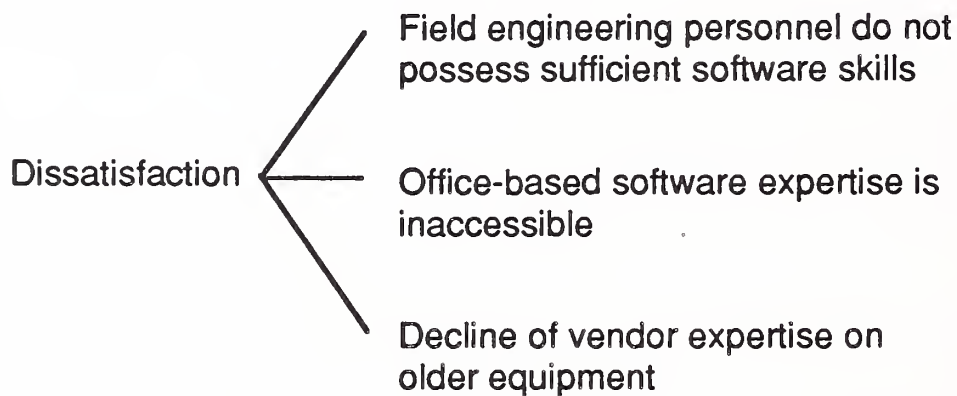
Exhibit II-10

The Recommended Evolution of the Field Engineers' Skills Mix

Hardware			Hardware
	The Evolution		Problem Management
Problem Management			Software
Software			
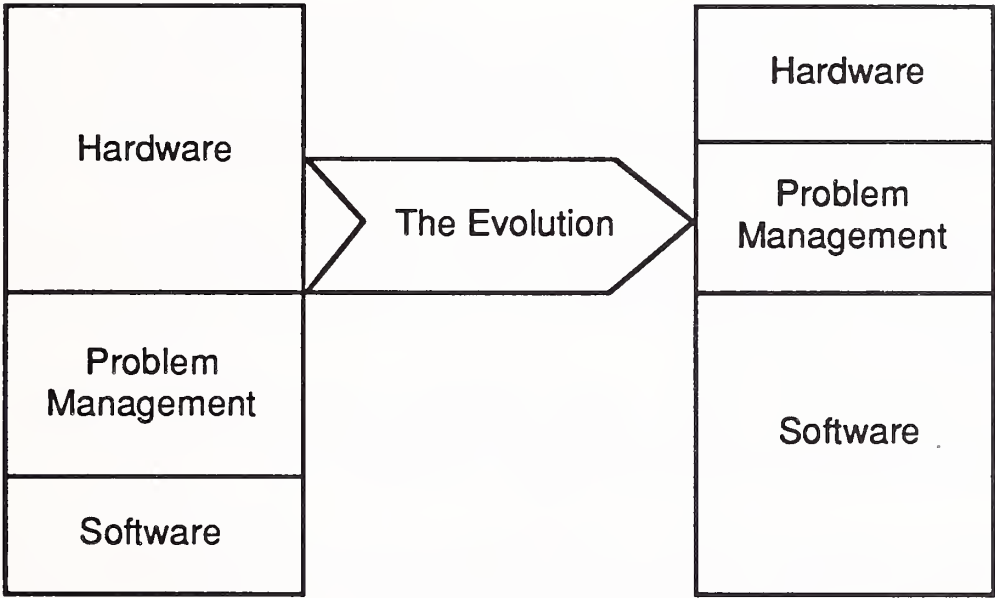
3. Documentation

Over the past four years, users have consistently rated the quality of documentation at a level of interest of at least 8 on a scale of 0-10 and have expressed a level of dissatisfaction varying between concern and real dissatisfaction. This data firmly indicates that the quality of documentation is of genuine concern to the user community.

A summary of the factors involved in the issue of documentation is provided in Exhibit II-11 and described below:-

· Problems are associated with the excessive quantity of documentation supplied coupled with difficulties encountered in comprehending the data. Constituent factors include a lack of adequate language translation and difficulties in indexing the required material.

· The quality of service is perceived to suffer because of difficulties encountered in maintaining documentation at the same release level as the software it supports. Dissatisfaction is also expressed in cases where the quality of presentation has fallen below an acceptable standard.

· Documentation is not considered sufficiently technically detailed to meet the needs of some operations and software development personnel.

It is apparent that the adoption of CD-ROM as a storage technology potentially allows the equipment vendor to address many of the issues which cause dissatisfaction to the customer base. It can, of course, also be considered as providing an additional marketing communications channel thereby adding further value to the medium.

Although the use of CD-ROM technology provides the obvious tool to tackle the root causes of dissatisfaction, the principal point at issue is that the quality of service provided is failing to meet the requirements of the customer. The key recommendation to be made is to ensure that the product meets the expressed requirements of the user and that the distribution mechanism permits the simultaneous delivery of software and the documentation to support it.
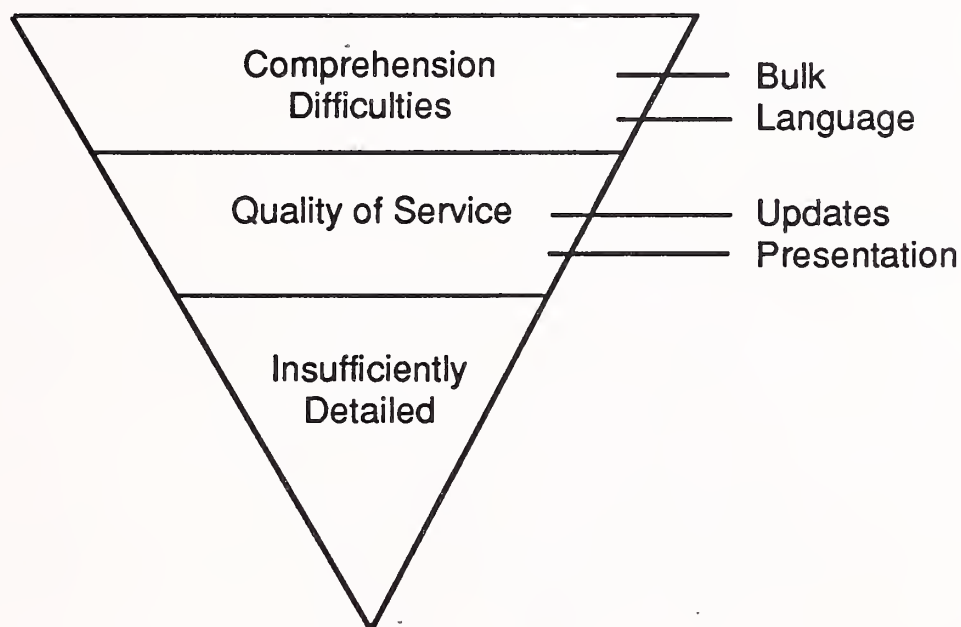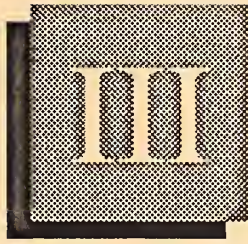
Market Analysis

III Market Analysis

A
Introduction

The systems software support market is regarded as a key area of opportunity for the customer services business. It is expected to generate revenues of approximately $1.3 million in Western Europe in 1991 and is regarded as a significant source of growth within the customer services market. It is one of the principal activities compensating for the well established declining growth of the hardware maintenance activity.

The objective of this section is to forecast the growth of that element of the market which is supported by the customer services function and to analyse the major market drivers and inhibitors which will influence future development.

The subject area is considered under two separate headings. Firstly, the product market is analysed to determine both size and growth and secondly, the market forecast estimates the growth of the Customer Services Software Support market within Western Europe from 1991-1996.

B
Definitions

The principal categories of software product are illustrated in Exhibit III-1, together with the division of support responsibility which is assumed to exist between customer services and professional services organisations. It should be noted that the dividing line does not correspond to that commonly applied to differentiate applications software from systems software. The servicing of applications development tools falls more neatly into the area of expertise offered by professional services rather than that of the customer services organisation.

The scope of the support market is defined in Exhibit III-2. It draws a key distinction between Generic Software Support, considered to be that element of the support product which is applicable to the customer base as a whole, and Customised Support which aims to satisfy the specific needs of an individual user. Although customer services support does have an involvement within all areas of the support matrix, it is generally concentrated within the implementation and post-sales phases of the sales cycle and across the range of multi-customer support.

Having defined the overall context within which customer services systems support operates, Exhibit III-3 details the systems software products supported by the customer services organisation. The exhibit makes clear the obvious links which exist between the traditional areas of expertise offered by customer services personnel and the support requirements of systems control products and operations management software tools. The exhibit therefore further underlines the logic behind the inclusion of the support of applications development tools within the sphere of professional services.

Exhibit III-1

The Software Market

Applications Software	Software Categories	Support Responsibility
	Applications	Professional Services
Systems Software	Applications Development Tools	
	Operations Management Tools	Customer Services
	Systems Control	

Exhibit III-2

The Boundaries between
Customised and Generic Software Support

Customised Software Support		
Pre-Sales	**Implementation**	**Post-Sales**

• Application Analysis
 	
• Requirements Definition
 	
• Product Evaluation
 	
• Customising
 	
• Cost Justification
 	
• Demonstrations
	• Consultancy
	
	• Planning
	
	• Software Development
	
	• Training
	
	• Parameterising
	
	• Installation
		• Consultancy
		
		• Application Development
		
		• Assistance
		  - Telephone
		  - On-Site
		
		• Problem-Solving
		
		• Training
		
		• Newsletters, User Clubs

SINGLE CUSTOMER

──────────── Customer Interface ────────────

MULTI CUSTOMER

Field Support	Distribution of Software and Documentation	Distribution of Patches and New Releases
Product Support	- Error Correction - Patches	
	- New Releases - New Versions	

Generic Software Support Area

Exhibit III-3

Systems Software Products
Market Structure

Systems Software

Systems Control	Operations Management Tools	Applications Development Tools

Systems Control
- Access Control
- Communications Monitors
- Micro-Mainframe Links
- Network Control
- Operating Systems
- Security Systems
- System Library Control
- Windowing Systems
- Other

Operations Management Tools
- Capacity Management
- Computer Operations Scheduling
- Data Center Management
- Disk Management
- Downtime/Repair Monitoring Management
- Job Accounting
- Performance Monitors
- Tape Management
- Utilities
- Other

Customer Services - Systems Software Support

Program Development and Production Tools
- Applications Generators
- Assemblers
- Automatic Documentation
- Configuration Management
- Debugging Aids
- Languages (All Generations)
- Systems Development Control
- Retrieval Systems
- Translators
- 4GL
- I-CASE
- Other

Data Base Management Systems
- Data Base Management Systems
- Data Dictionaries
- Other

C
Product Market Analysis

The growth pattern of the customer services software support market is illustrated in Exhibit III-4. Assuming a Pan-European inflation level of approximately 6% over the forecast period, it is estimated that the real rate of growth will be about 9%. It should be noted that the growth anticipated for the forecast period represents a marginal decline when compared with the growth rate achieved during the latter years of the last decade. It is considered that four factors will serve to constrain the growth rate to it's anticipated level.

In the first instance, the anticipated slow down in the overall IT market caused by the uncertain economic outlook will have an impact on future support revenues. It is assumed that the economic slowdown currently being experienced in much of Western Europe will result in IT investment decisions being delayed. Such postponements will obviously permit the continuation of revenue streams from older equipment. However, in the case of software support, which relies upon the rapid evolution of software products to maintain demand, older products, on which development has ceased, do not provide the same revenue opportunities as newer, more rapidly evolving products.

Secondly, as capital spending in IT continues to grow, concerns are being expressed at the uncertain levels of return such investments have historically achieved. Increasingly, therefore, IT investment decisions are being closely controlled by senior management within end user companies, resulting in the application of tighter investment criteria to proposals for capital spending on IT projects. Such a trend has obvious implications for the future levels of IT investment with potential ramifications for support revenues.

Thirdly, the issue of bundling has had a significant impact on the development of the software support market. Of the leading 15 equipment vendors in Western Europe, the following bundle or part-bundle software support with the software licence fee:

- IBM
- NCR
- ICL
- Siemens Nixdorf

The four companies combined account for approximately 46% of the overall customer services revenues of the top 15 vendors and the bundling of support obviously has a significant impact on the growth of the software support market. However, two factors should be considered in connection with the issue of software support bundling.

- No clear trend has been established in the direction of either bundling or unbundling software support implying that revenue growth could be both positively or negatively affected by the emergence of a consensus among the major vendors. For example, should IBM decide to introduce the EXCEL programme into the European market the overall level of software support revenues will be substantially increased.

Exhibit III-4

Western European Customer Services Software Support Market Comparative Growth, 1987-1996

    Copyright 1991 INPUT. Reproduction Prohibited.
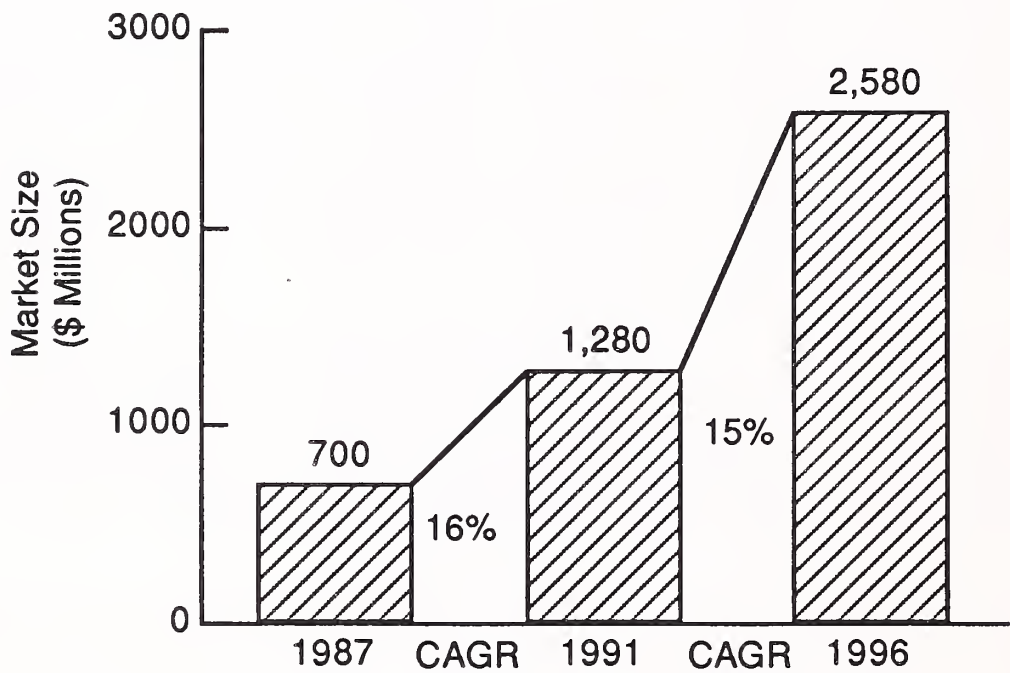
· **INPUT** excludes bundled or captive revenues from the measurement of markets, including only those elements of user expenditures that are open to free market competition.

Taking into account the factors outlined above, it is obviously difficult to provide an accurate assessment of the future direction of the bundling issue.

Finally, it is anticipated that the move towards Open Systems, as exhibited by the growth in the number of users moving to UNIX, will have the effect of reducing growth in the overall customer services support market. The principal factor behind this assertion is that the move towards Open Systems will have the effect of reducing the in-built competitive advantage held by equipment vendors who provide systems software support on proprietary products. The difficulty inherent in developing and maintaining skills in proprietary software products has proved to be a significant barrier to entry to independent maintenance companies. The adoption of open systems products will have the effect of opening the market to a broader range of competitive pressures.

D
The Market Forecast

The market forecast only includes those revenues from software support which fall within the customer services market. Exhibit III-5 compares the growth of the Western European markets in US Dollars, which is supported by Exhibits III-6 and III-7 which provide details of the data in local currency and ECU's respectively.

An overall compound annual growth rate of 15% is forecast for Western Europe over the period, which is almost three times the anticipated overall European rate of inflation. The principal factors driving this growth are considered to be threefold.

· Firstly, the figure is consistent with the overall level of importance being attached to the future growth of those areas of the customer services market which fall outside the traditional hardware maintenance activity. The requirement to compensate for the well established trend of declining growth of hardware maintenance revenues will provide a consistent motivation for vendors to continue to seek growth from products such as software support.

· Secondly, there is evidence to suggest that pricing policies of vendors are inclined to maximise revenue growth from systems software support. Exhibit III-8 compares the rate of price increases levied for systems software support with the rate of inflation in the major countries within the European market. The principal conclusion to be drawn from the exhibit is the extent to which vendors have been seeking to impose price increases which are significantly above the rate of inflation. It should be observed that a degree of user dissatisfaction exists with the level of price increases being imposed. Although only Germany and, to a lesser degree, France, show very significant levels of dissatisfaction, it should be noted that an increase in the level of dissatisfaction expressed by users will potentially inhibit the extent to which vendors will be able to see a growth in revenues through the medium of pricing increases.

- Thirdly, it is recognised that users place a very significant degree of importance on the provision of systems software support. The **INPUT** 1990 User Survey indicates that the average importance attached to systems software support by users was approximately 8.5 on a scale of 0-10. Systems software platforms are becoming increasingly complex, owing to such factors as the growth in networking systems solutions, and it is predicted that the trend is likely to ensure that an importance rating of this magnitude will continue to be returned over the forecast period.

Although these factors will obviously have a significant effect on the growth of the overall systems software support market, it is predicted that the majority of the growth will be achieved by equipment vendors. It is estimated that currently only 15% of users have contracted the support of systems software to independent vendors. The explanation behind the figure is that users doubt the ability of the independent sector to adequately support systems software. The degree to which vendors will continue to enjoy a near monopoly within the systems support market of their own user base depends on the degree to which potential competitors are able to exploit market opportunities. Three such opportunities can currently be identified:-

Exhibit III-5A

Austria Systems Software Support Market Growth, 1991-1996
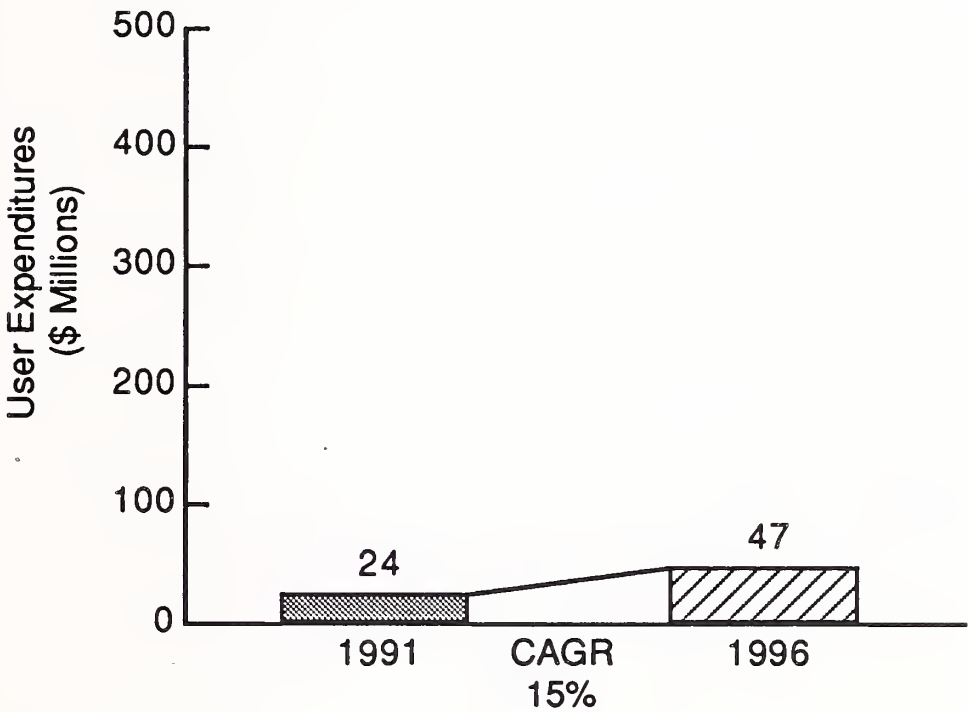
Exhibit III-5B

Belgium Systems Software Support
Market Growth, 1991-1996

Copyright 1991 INPUT. Reproduction Prohibited.   CE-SW1
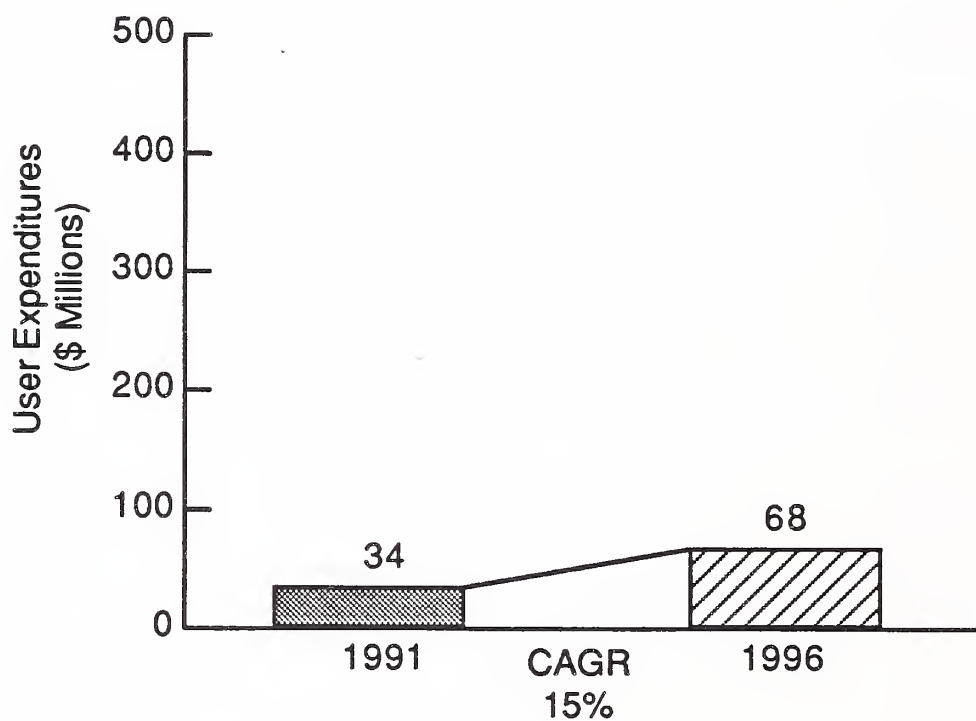
Exhibit III-5C

Denmark Systems Software Support
Market Growth, 1991-1996
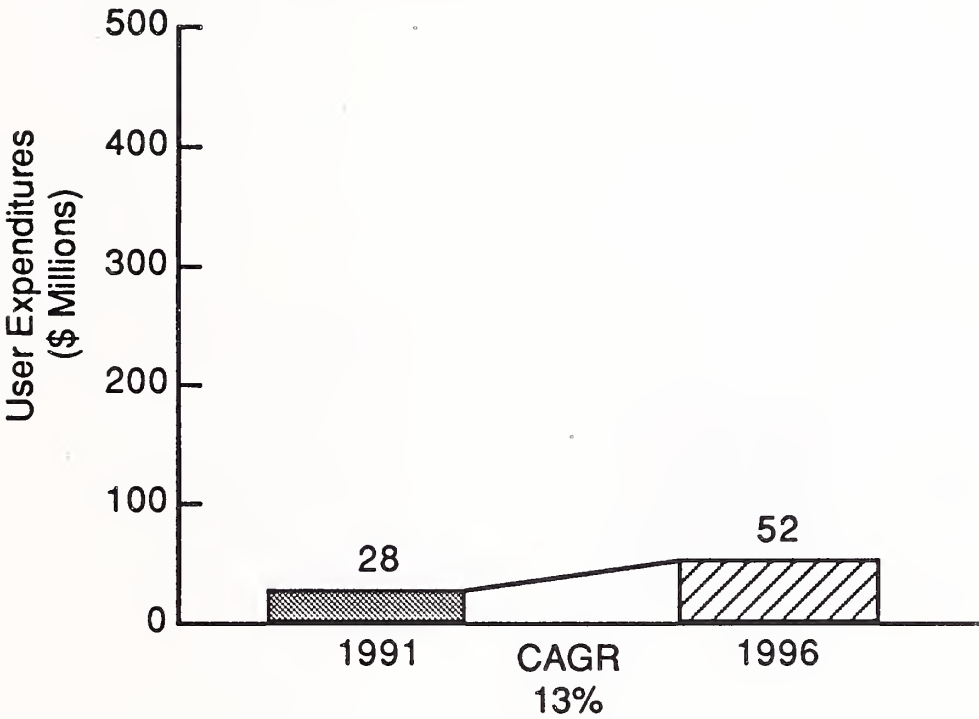
Exhibit III-5D

France Systems Software Support
Market Growth, 1991-1996

Exhibit III-5E

Finland Systems Software Support
Market Growth, 1991-1996

Exhibit III-5F

Germany Systems Software Support
Market Growth, 1991-1996

Exhibit III-5G

Italy Systems Software Support Market Growth, 1991-1996
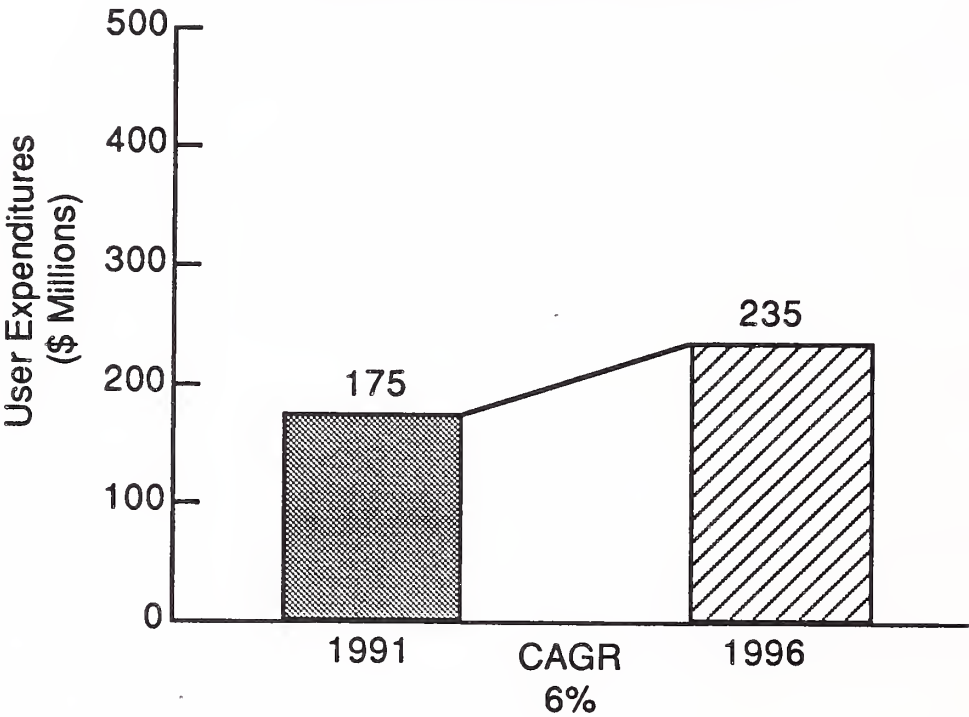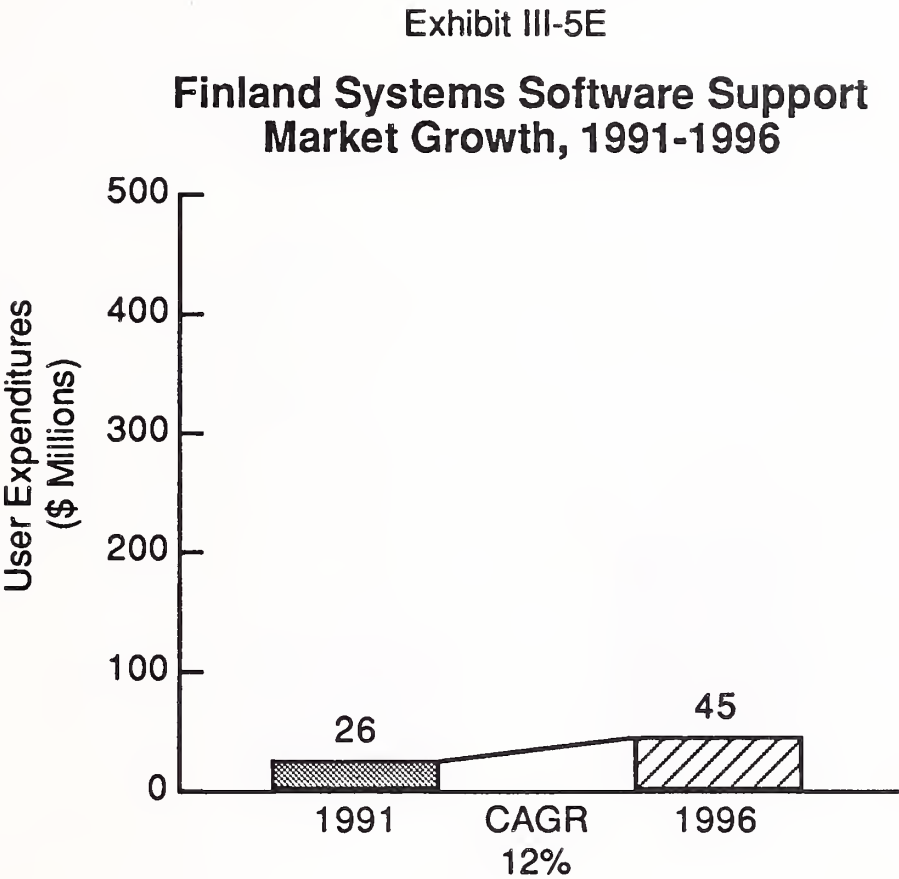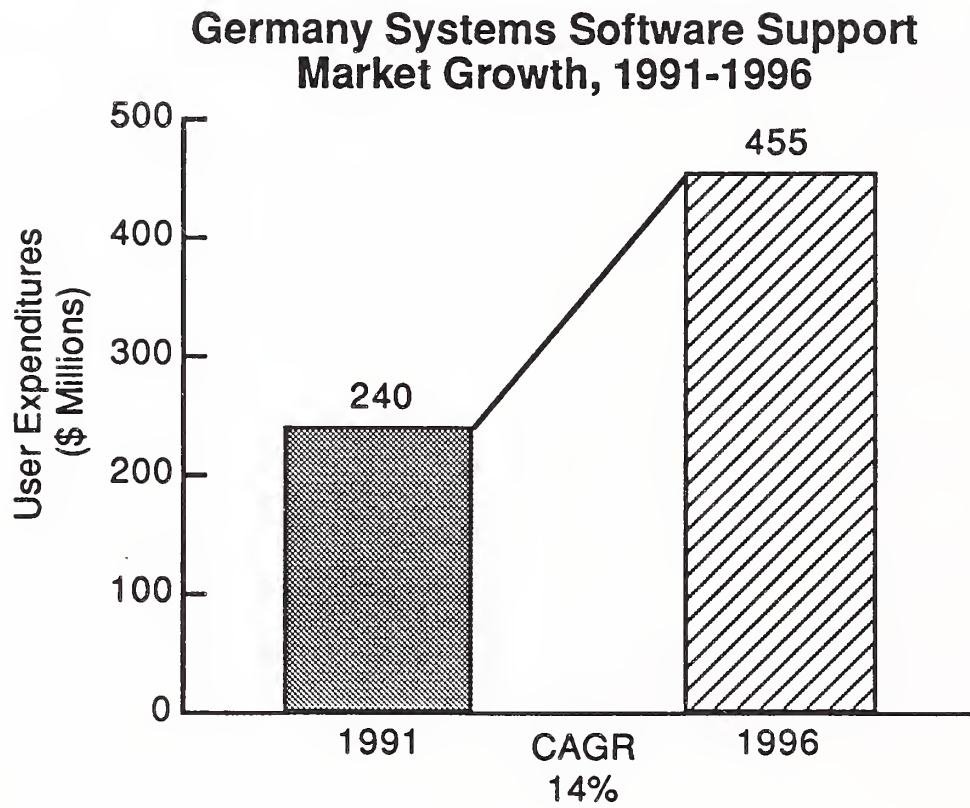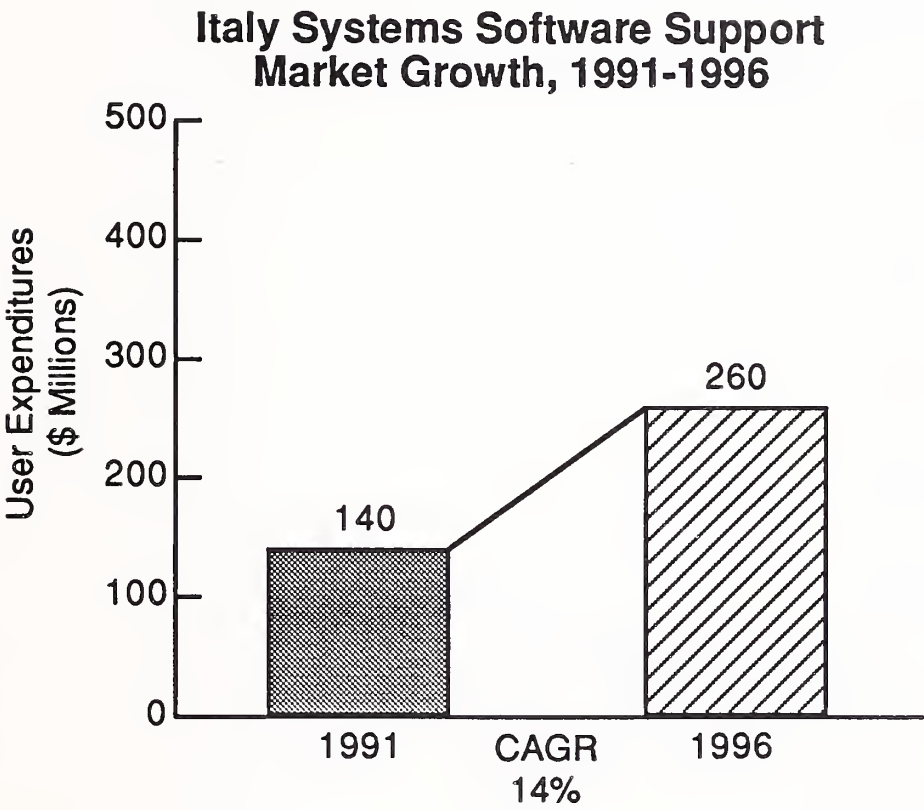
Exhibit III-5H

The Netherlands Systems Software Support
Market Growth, 1991-1996

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Exhibit III-5I

Norway Systems Software Support
Market Growth, 1991-1996

User Expenditures
($ Millions)

500

400

300

200

100

73

34

0

1991   CAGR   1996
              17%
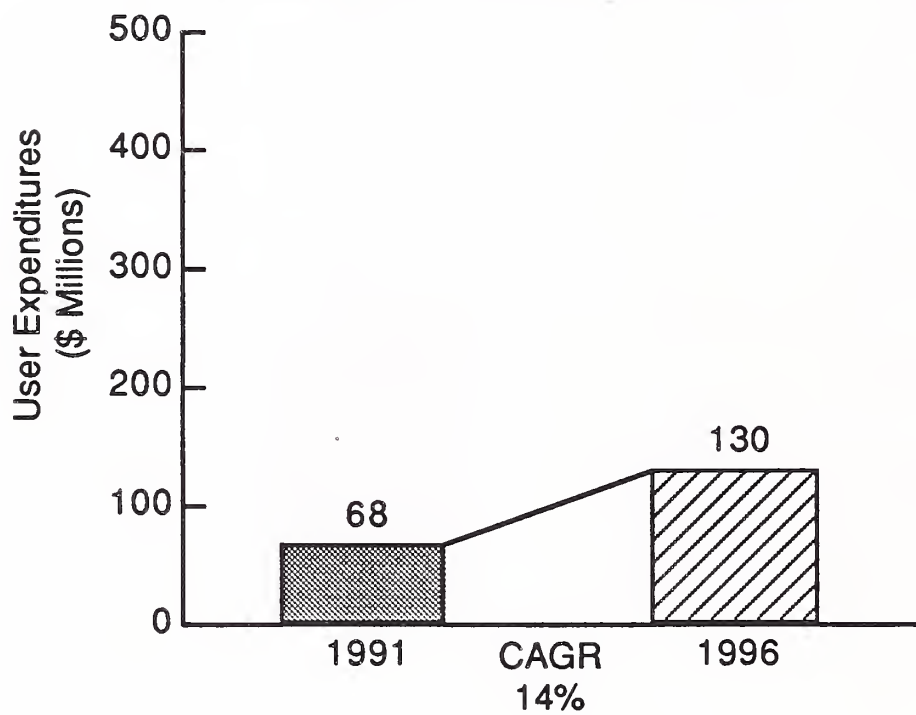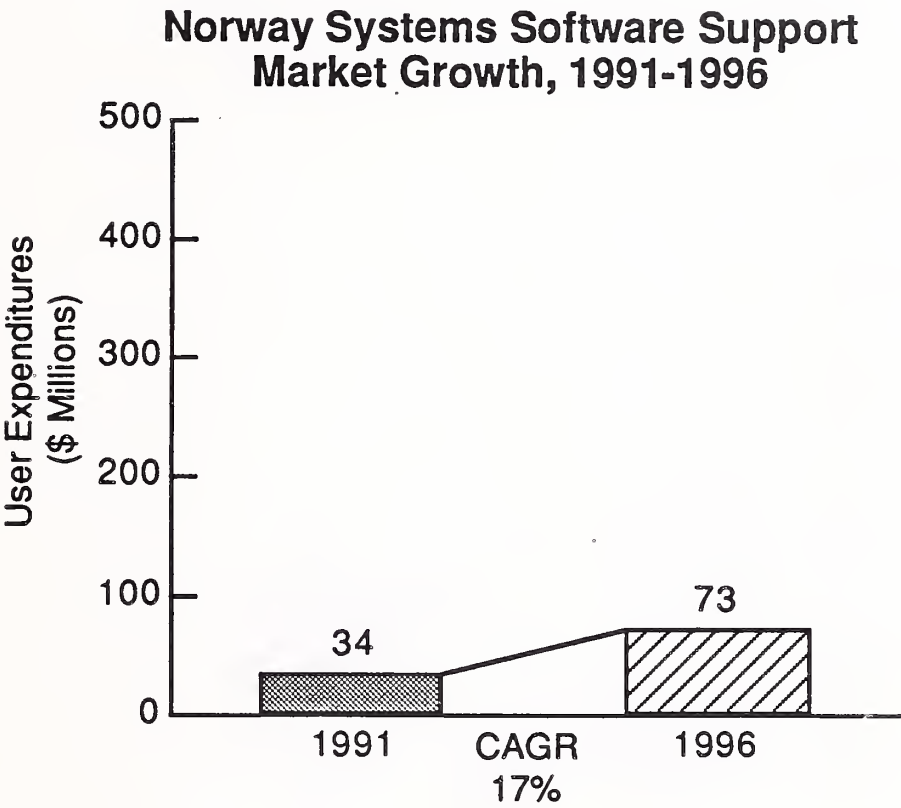
Exhibit III-5J

Spain Systems Software Support
Market Growth, 1991-1996

Exhibit III-5K

Sweden Systems Software Support
Market Growth, 1991-1996

Exhibit III-5L

Switzerland Systems Software Support Market Growth, 1991-1996
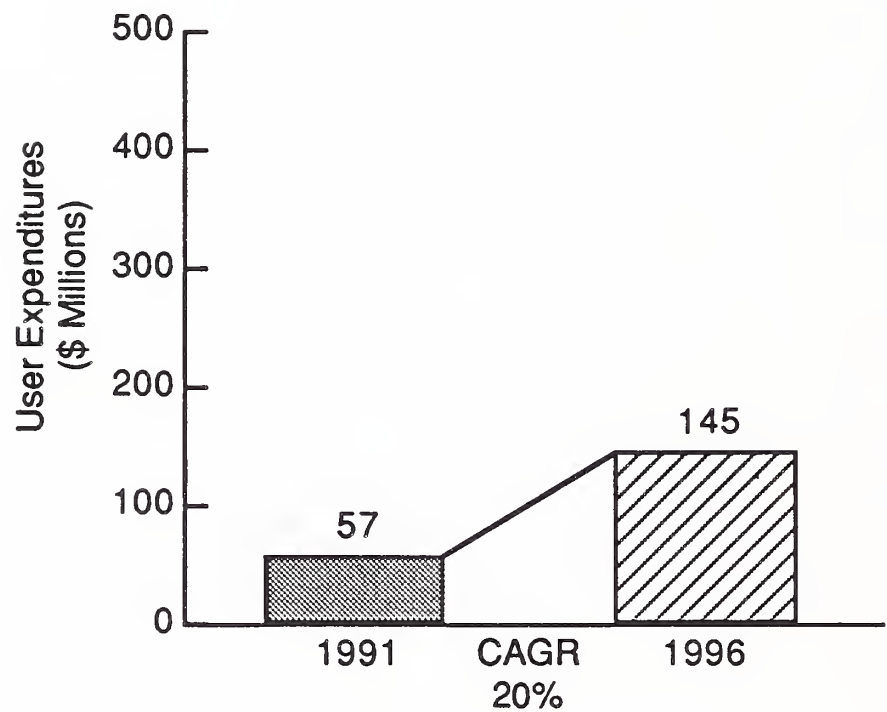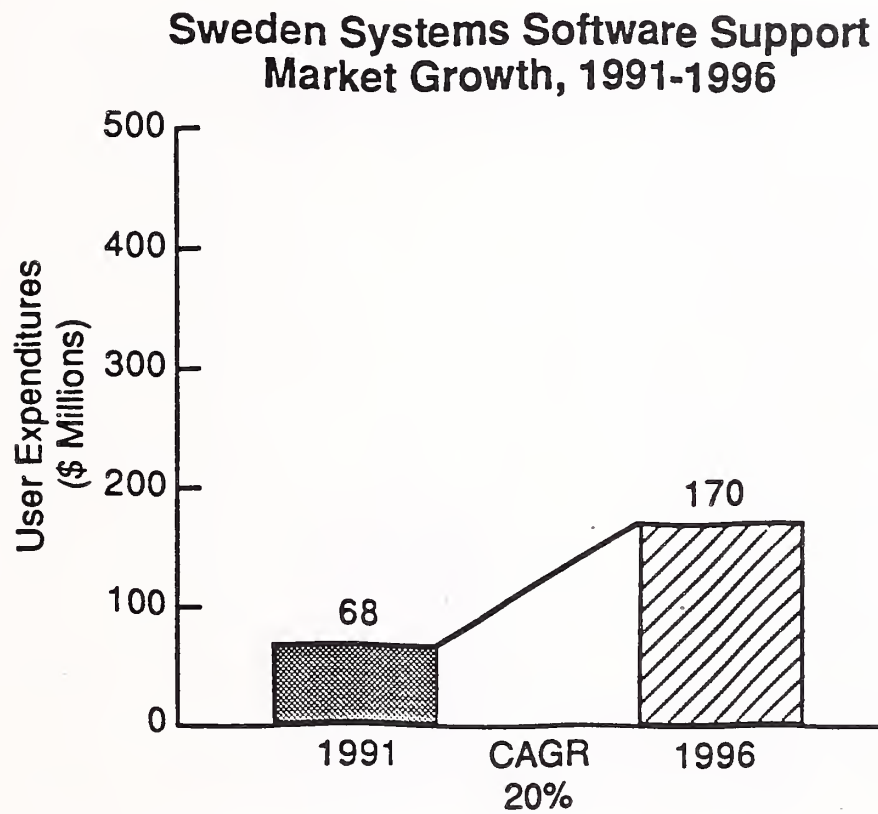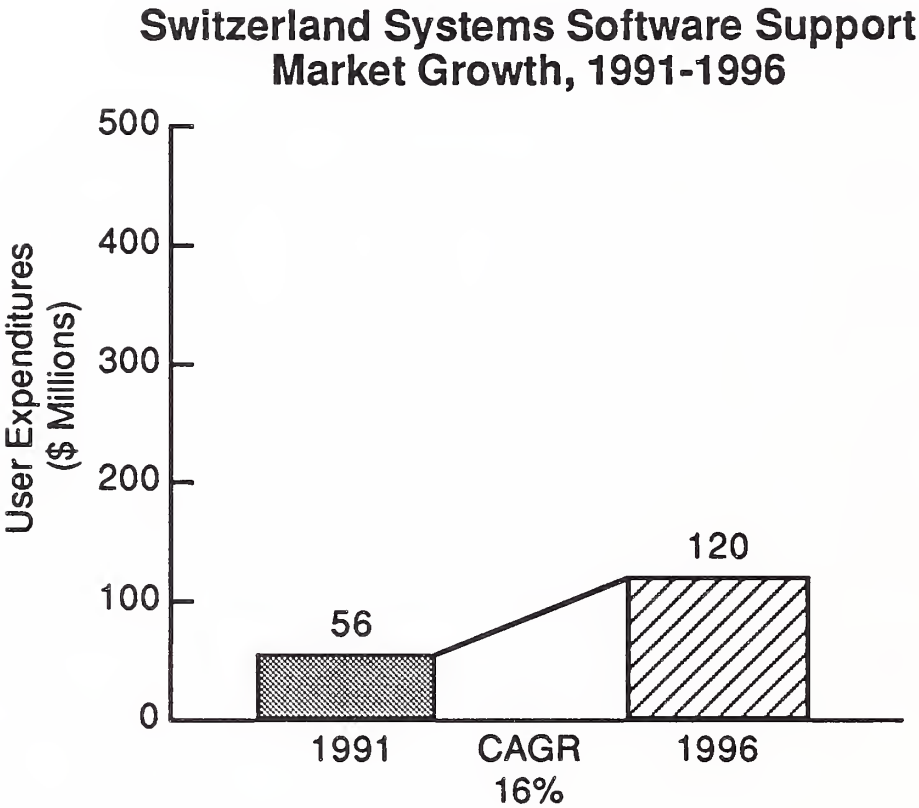
Exhibit III-5M

United Kingdom Systems Software Support
Market Growth, 1991-1996
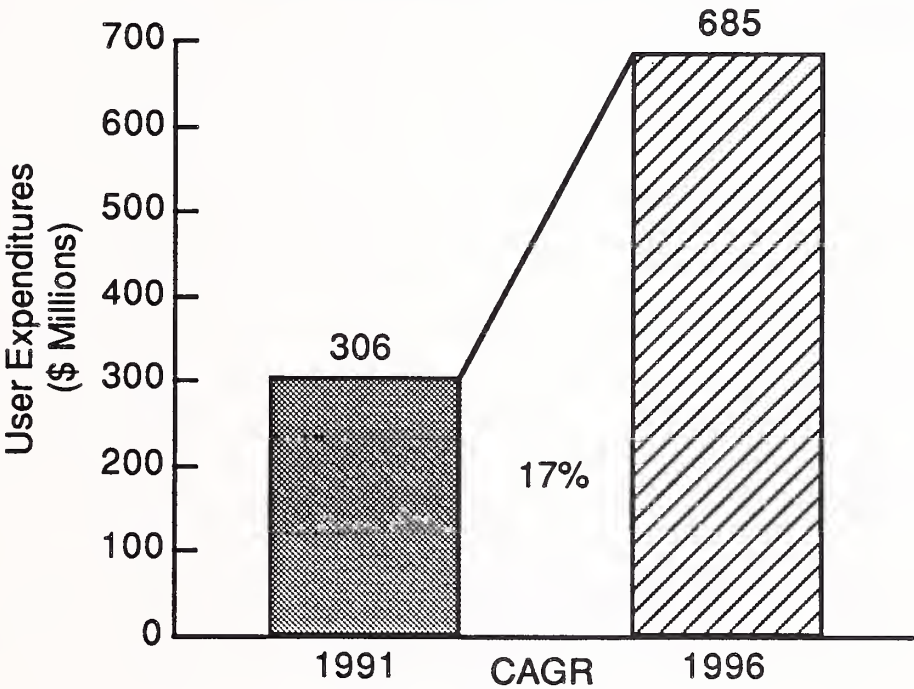
Exhibit III-5N

Rest of Europe Systems Software Support Market Growth, 1991-1996

CE-SW1
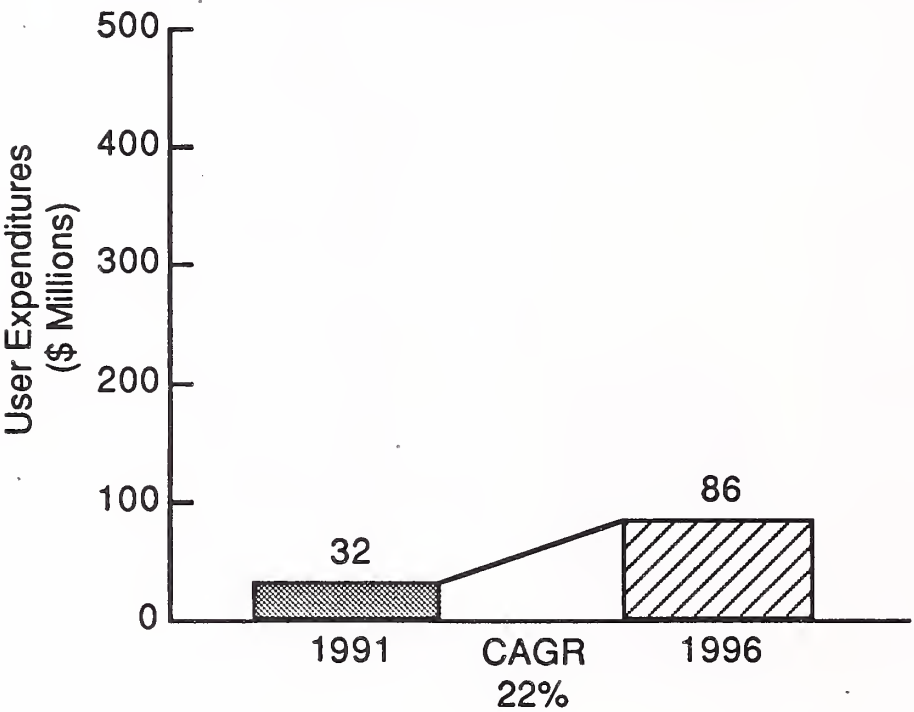
Exhibit III-6

Western European Systems Software Support Market Growth, 1991-1996

Country	User Expenditure (Local Currency)			
	1990	1991	1996	CAGR (Percent) '91-'96
Austria (SchM)	263	302	600	15
Belgium (BFM)	1100	1280	2600	15
Denmark (DKM)	172	200	365	13
France (FFM)	1010	1080	1450	6
Finland (FMM)	99	110	190	12
Germany (DMM)	380	435	820	14
Italy (LB)	158	185	350	14
The Netherlands (DFIM)	120	140	270	14
Norway (NKM)	190	230	500	17
Spain (PtaM)	5440	6600	16600	20
Sweden (SKM)	355	435	1090	20
Switzerland (SFM)	75	90	190	16
United Kingdom (£M)	162	193	430	17

Exhibit III-7

Western European Systems Software Support Market Growth, 1991-1996

Country	User Expenditure (ECUs Millions)			
	1990	1991	1996	CAGR (Percent) '91-'96
Austria	18	21	42	15
Belgium	26	30	61	15
Denmark	22	26	47	13
France	147	157	211	6
Finland	20	23	39	12
Germany	185	212	400	14
Italy	110	120	230	14
The Netherlands	52	61	117	14
Norway	24	29	63	17
Spain	42	51	128	20
Sweden	48	59	147	20
Switzerland	42	50	106	16
United Kingdom	219	261	581	17
Rest of Europe	31	39	104	22

Exhibit III-8

Systems Software Support
Price Increases and User Satisfaction
Related to Inflation Rates in European Country Markets

Overall User
Satisfaction with Price
ΔSI

Country		ΔSI
Benelux	4 / 6.6	1.0
France	4.5 / 10.5	1.8
Germany	4 / 7.6	2.8
Italy	7 / 12.8	1.4
Norway and Sweden	6.5 / 7.8	1.1
Spain	6.5 / 13.7	1.5
United Kingdom	7 / 7.4	1.3

0   5 Percent   10   15
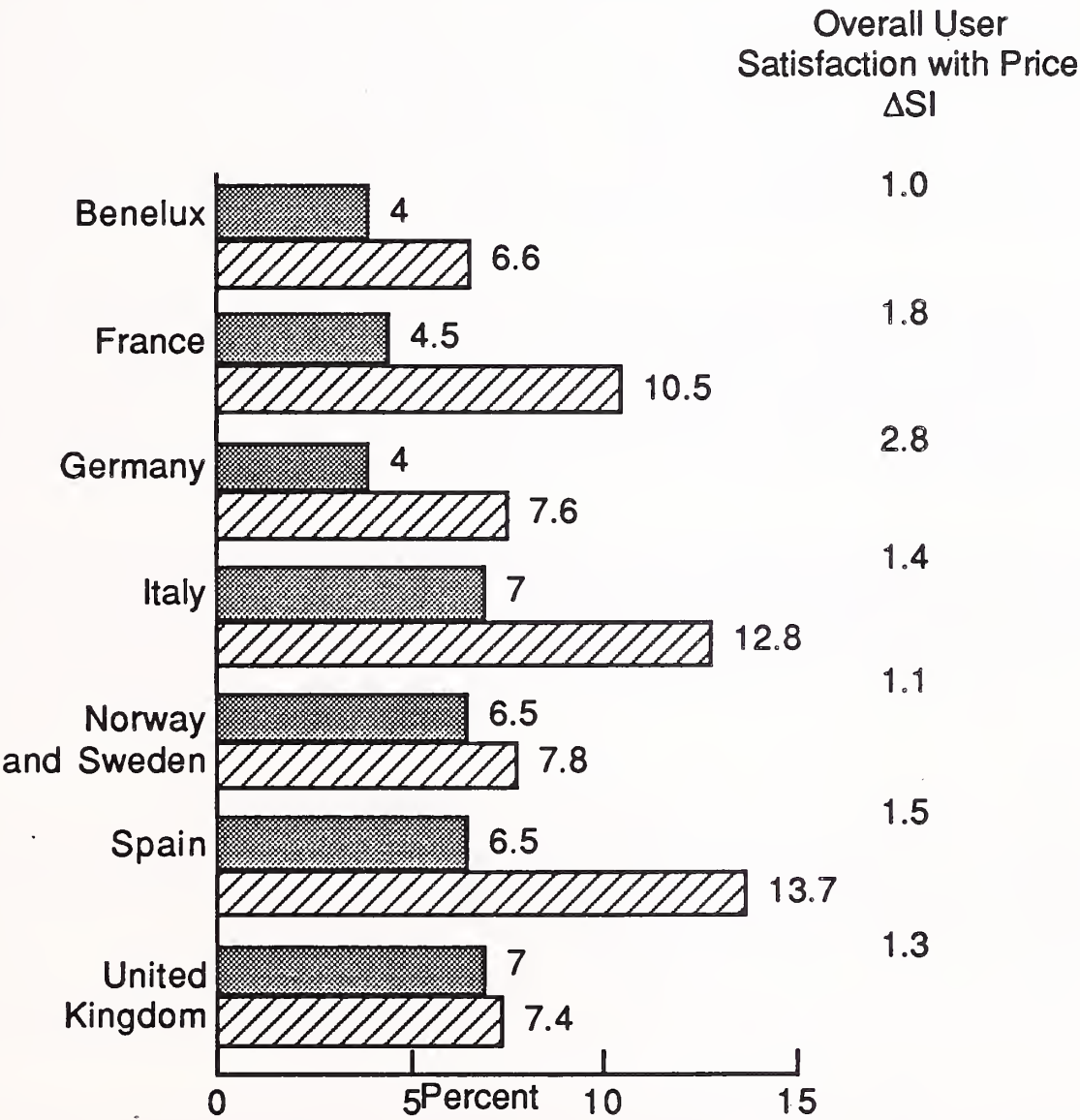
▦ Estimated Rate of Inflation

▨ Systems Software Support
     Pricing Increases 1989

Sample Size: 732
Standard Error: 0.3
Source of Data: INPUT 1990 User Survey

· A rapid migration of users to standard products such as UNIX over the forecast period would increase the likelihood of competition within the systems software support market leading, potentially, to competitive pressure on prices. The possible emergence of a high volume of products which conform to an agreed set of standards would have the effect of reducing the technical barriers to entry created through the use of proprietary software, thereby increasing the number of credible competitors within the market.

· Professional Services vendors are in a position to attack the market, principally owing to the fact that their technical expertise in the software arena provides them with the ability to effectively support systems software products. However, in addition to the overall level of support they can offer, a number of professional service vendors have developed software tools to assist in the management of the systems platform, which, in some cases, compete directly with products supplied by equipment vendors. Such companies are in a position to use such products as a lever to gain a foothold from which to amount an attack on the overall systems support marketplace.

· The move by a number of Professional Service organisations into the systems operations market provides the opportunity for such vendors to include systems software support within a systems operations contract. It is possible to identify an obvious synergy between the support of applications software, which would naturally be included within the services provided by a systems operations supplier, and the support of the full range of systems software.

The extent to which Professional Services vendors are able to take advantage of such opportunities will obviously significantly influence the ability of equipment vendors to profit from the forecast growth in the market.

E
Conclusion

It is concluded that, over the period of 1991-1996, the customer services systems software support market will grow at a compound annual growth rate of approximately 15% which is approaching three times the overall European rate of inflation.

The principal factors contributing to the ongoing growth of the sector are as follows:-

· The increasing complexity of systems software platforms, caused by such factors as the growth in networked computer installations, will lead to increased demand for systems support services.

· Users are proving to be unwilling to contract the support of systems software to independent vendors. It is predicted that equipment vendors will maintain a market share of greater than 80%. The lack of competition posed by the independent sector will allow equipment vendors to continue to levy price increases over and above the rate of inflation, thereby expanding the revenue growth of the market.

- The continuing decline of the growth in the hardware maintenance sector is leading vendors to continue to attack the growth sectors within the market. This factor will therefore continue to push the growth of the market.

Five factors are regarded as inhibiting the market and can be seen as explanations for the anticipated slow-down in the rate of growth.

- The uncertain economic outlook in Europe will continue to affect the growth of the IT market in general and will therefore have an obvious impact on the growth of services.

- It is anticipated that strict business investment criteria will increasingly dictate the pattern of IT spend within the end-user community, as opposed to the reliance placed upon the judgement of technical staff which has largely characterised investment decisions up to this point in time. Such a trend will potentially affect the rate of growth within the IT industry generally with a consequent impact on systems software support.

- The bundling of software support revenues into the software licence fee will continue to have a potential effect on the revenues generated by the systems software support stream. A degree of confusion still exists within both the user and vendor communities over the advantages of bundled or unbundled support. The potential therefore remains for the bundling issue to serve as a significant factor influencing the flow of revenues through the systems support stream.

- The growth of standard operating systems such as UNIX will potentially increase the level of competition in the market as vendors increasingly lose the protection afforded by proprietary systems. This factor implies that the growth of open systems will have an affect on the ability of hardware vendors to profit from the anticipated growth of the market.

- A number of opportunities exist for Professional Services vendors which will potentially allow them to attack the market. They have highly developed software skills which can be utilised within the systems support arena. Software products are being developed to assist in the management of the systems platform which give vendors a presence in the market. Finally, the entry of Professional Services vendors into the systems operations marketplace provides them with the opportunity to include systems support within a systems operations contract.

The extent to which the growth in the market adheres to the predicted expansion depends upon the balance that will be established between these factors. Hardware vendors possess the skills to profit from the future growth in the market. However, vendors must be aware of, and be prepared to respond to, the significant threats that do exist within the environment.

IV

Bundling Issues

IV   Bundling Issues

A
Introduction

It is commonly accepted that the trend towards the unbundling of systems software support from the software licence fee has been established for several years. Many of the major vendors market a systems support service as a product separated from both the hardware maintenance contract and the software license fee. However, despite the frequency with which this strategy has been adopted, unbundling cannot be regarded as a universally accepted policy. Several European vendors, including IBM, retain a policy of bundling software support with the software license fee.

The purpose of this section is to consider the factors which affect the formulation of policy relating to the provision of systems software services and to assess the extent to which such factors are likely to influence the future direction of the bundling issue. Exhibit IV-1 provides a diagrammatic representation of the principal forces influencing the decision to bundle or unbundle software support, indicating the approximate weighting applied to each factor.

The data used in the study has principally been derived from a series of detailed interviews with a cross section of the major European vendors, aimed at gaining a full impression of the range of factors currently affecting the issue.

Exhibit IV-1

The Principal Factors Influencing the Bundling or Unbundling of Systems Software Support

Factors

Technical complexity of hardware support ←→ Technical complexity of software support

Customer budget restrictions ←→ Customer tendering requirements

Pressure to generate alternative revenue streams →

The large systems marketplace ←

Development of software support departments as profit centers →

```
100          0          100
Bundled                 Unbundled
```

    CE-SW1
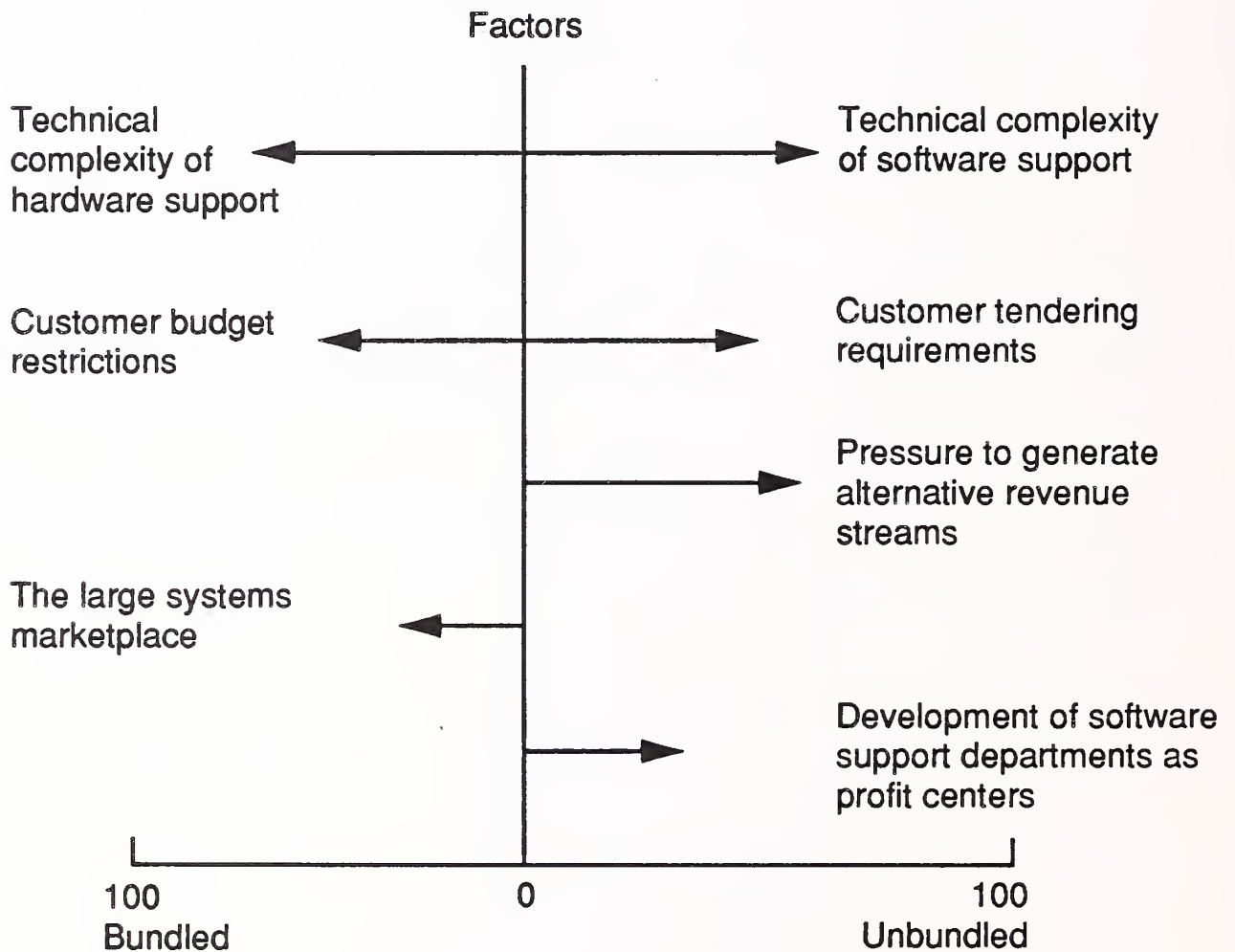
B
Comparative complexity - Hardware and Software

One of the principal factors affecting the bundling decision is the relationship that exists between the respective degrees of complexity involved in the hardware and software maintenance operation. Exhibit IV-2 provides a conceptual representation of the relationship. Cases in which the hardware maintenance task is more complex than the software maintenance process will encourage the adoption of a bundling strategy. There is not sufficient demand for a separate software support product in cases where software is perceived as being both easier to maintain and more reliable than the hardware on which it operates. One of factors supporting this assertion is that many of the major competitors within the large systems market retain a bundling strategy. Examples include IBM, Bull, Amdahl, Hitachi Data Systems and ICL.

It is generally accepted that the evolution towards increasingly complex systems software platforms has led to a corresponding increase in the complexity inherent in the support required. The growth in the use of networked systems and databases can be seen as two of the principal developments behind this evolution. A number of vendors are actively considering the development of software skills within their field engineering functions and some companies have implemented a policy which dictates that all field engineers will possess software skills. The change in the relationship between the comparative complexity of the hardware and software maintenance functions is represented diagrammatically in Exhibit IV-3. The continuing adoption of modular hardware component design and the continued improvement in the reliability of hardware will contribute towards the decline in the complexity of the maintenance activity. However, it is accepted that the complexity of the software support operation will continue to increase.

The change in the relationship between the two maintenance arms is one of the principal factors driving the move towards the unbundling of systems software support. The rise in the relative importance to the customer of software support increases the viability of marketing such support as a separate product and increases the opportunity for generating revenue from such a product.

Exhibit IV-2

The Influence of the Complexity of Hardware on the Software Support Decision

Bundled

Software
Support
Vendor
Strategy

Unbundled

Complex   Simple

Complexity of Hardware Maintenance
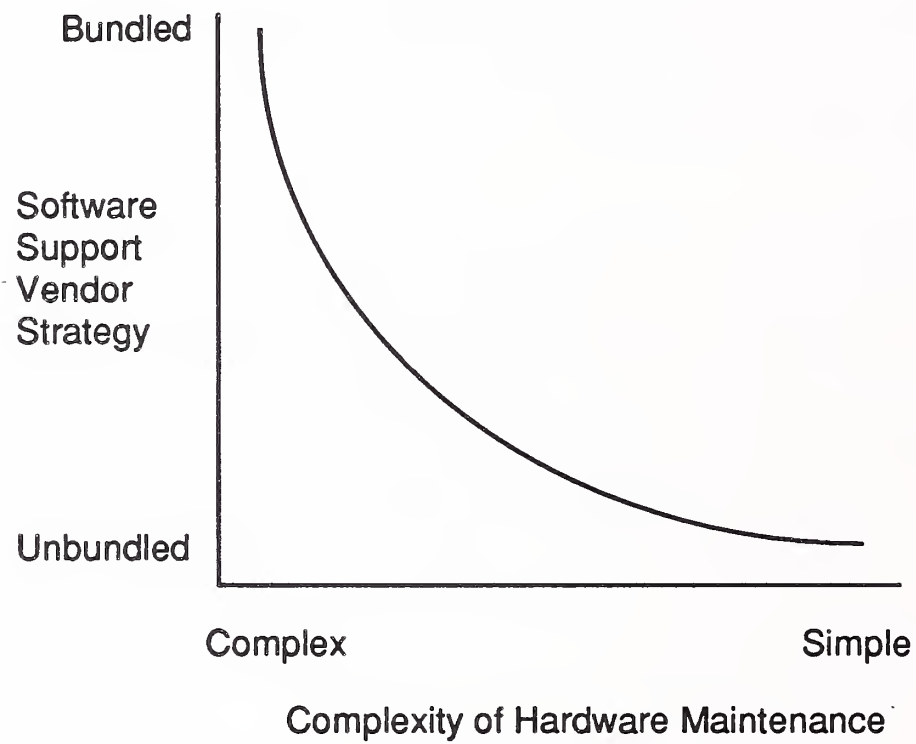
Exhibit IV-3

The Relationship Between
Hardware and Software Complexity

High   Hardware
Support   Software
Support

Level of
Maintenance
Complexity

Low

Time
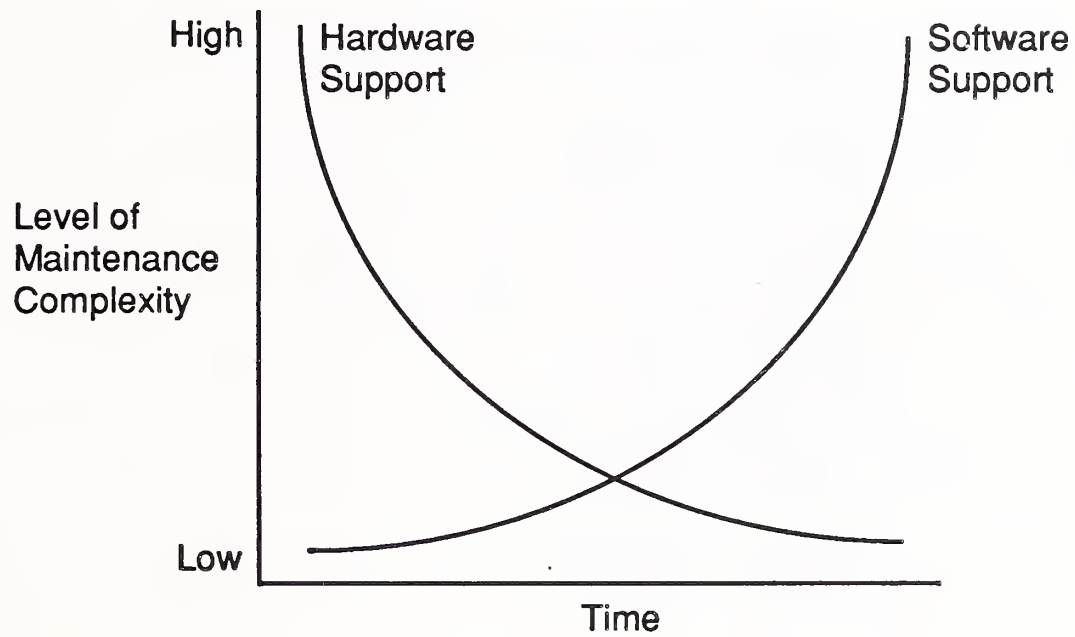
C
The Customer's Preference

Exhibit IV-4 indicates the degree to which no firm consensus has developed within the user community on the bundling issue. Opinion is generally evenly divided on the issue with the single exception of the government sector. The preference expressed in favour of individual pricing can be attributed to the importance attached by government administrations to the detailed itemisation of expenditure. Such a requirement is obviously effectively satisfied by an unbundled approach to service provision.

Although the body of data indicates the absence of a firm consensus, in-depth interviews with users have identified that a relationship exists between a preference for bundled support and a financial environment in which budget cuts are being implemented. The financial pressures recently applied to the UK Higher Education sector, for example, has led systems administrators within universities to express a preference for bundled support contracts owing to the uncertainty relating to future funding levels.

However, the conclusion drawn from the available data is that the customer base remains undecided on the relative merits of unbundled or bundled support.

III - C - IV - **6**   CE-SW1

Exhibit IV-4

Customer Preference for Unbundled Support Western Europe

Manufacturing	50	41	9	100
Finance	48	44	8	100
Distribution	46	45	9	100
Public Sector	48	46	6	100
Government	50	34	16	100
Services	48	45	7	100

0   20   40   60   80   100

Customer Preference (Percent)
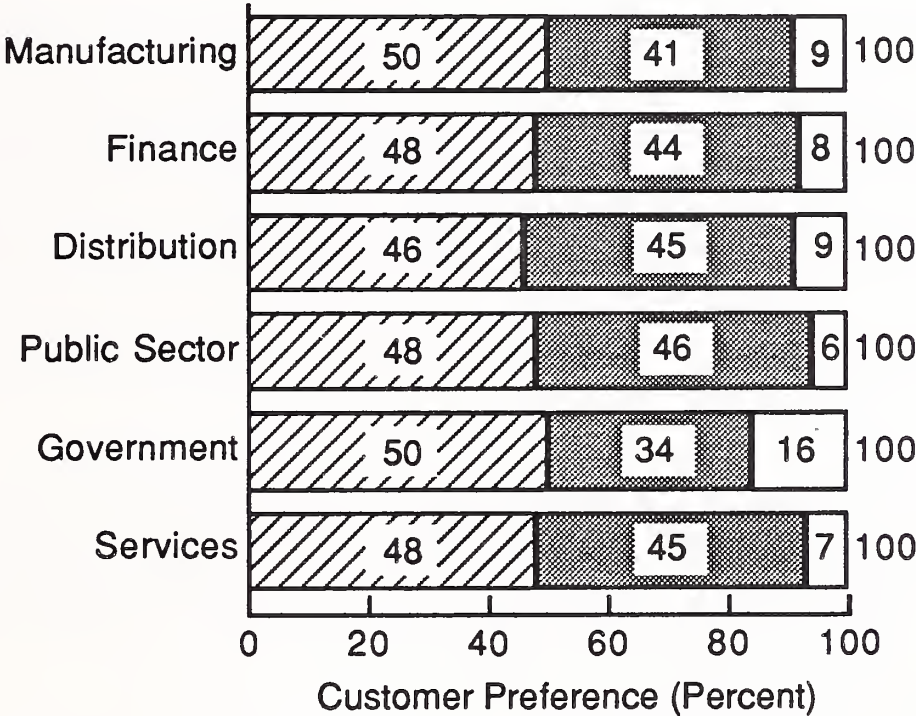
☐ Do Not Know

▦ Bundling

▨ Individual Pricing

Sample = 1,626

Source: INPUT 1989 User Survey

D
Miscellaneous Factors

Three additional factors can be considered as having an impact on the bundling issue. Although they are not as significant as either the comparative complexity of the hardware and software maintenance programmes or the attitude of the customer base, they do have an influence on the overall issue.

1. The Large Systems Market

In addition to the fact that the large systems hardware platform can be considered as more complex than that of either the medium or small systems ranges, a further factor continues to provide an incentive to retain a bundling strategy. The bundling of additional services to enhance the value of the standard contract has been identified by vendors as an important differentiating factor. The "plug compatible" market provides a particularly noteworthy example. Owing to the fact that there are obvious limits on the extent to which products can be differentiated, the ability to use the service package to develop a differential advantage assumes increased importance.

Consequently there is pressure within the large systems market to provide added value to the user through enhancing the basic service contract. Although not eliminating the development of an additional range of services marketed separately from the basic service contract, this factor does significantly increase the likelihood that the delivery of systems software support will remain bundled.

2. The Development of Additional Services

One of the notable driving forces encouraging the development of a strategy of unbundled support is the well advertised relative decline in the growth of hardware revenues. Exhibit IV-5 illustrates the forecast growth of the hardware service market compared to that of the systems software support market. Despite the significant difference in volume between the two revenue streams, the higher compound annual growth rate anticipated for the systems software support market provides a clear indication of the scale of the relative decline of the hardware service sector.

The unbundling of the constituent elements of the overall service package is one of the more obvious methods that can be employed to develop a range of marketable products. The systems software support service, as a product with a comparatively high growth potential, provides an obvious opportunity to develop a separate revenue stream, particularly for those vendors providing a complex systems software platform.

It is anticipated that the future decline in the growth of the hardware maintenance market will continue to provide an encouragement to vendors to unbundle software support products.

3. The Quality of the Service

Problems have been encountered by vendors who have developed a telephone helpline as the principal means of delivering software support while retaining a policy of bundling software support revenues. Despite the key role that helplines play in determining the perceived quality level of a vendors support capability, there is a tendency to regard the service as a cost, leading to a failure to provide adequate levels of investment.

The unbundling of the software support service into a separate revenue earning product facilitates the transfer of the service into a profit centre. Meaningful investment criteria can then be developed under which a level of investment can be made, thereby leading to an improvement in the quality of the service. This factor provides a significant encouragement to unbundle software support, particularly for those vendors supporting a complex systems software product range.

Exhibit IV-5

A Comparison of the Growth Forecast for Hardware Maintenance and Systems Software Support—Western Europe, 1990-1995

CAGR
(Percent)

Hardware
Service — 13.1 / 15.9 — 4%

Systems
Software
Support — 1.1 / 2.3 — 15%

User Expenditures ($ Billions)

▓ 1990

▨ 1995

 CE-SW1
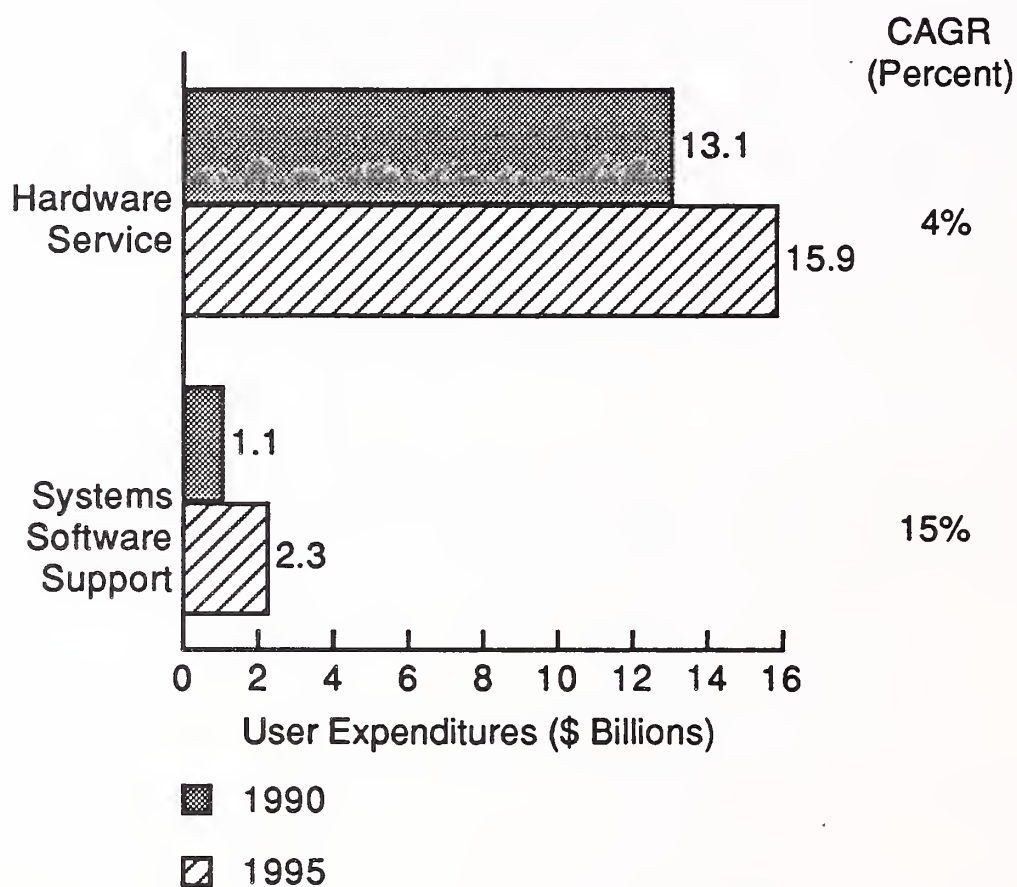
E
Conclusion

The existence of a wide variety of factors encouraging the adoption of both bundled and unbundled support strategies effectively negates the possibility of identifying a clear trend in either direction.

The principal factors favouring bundling are summarised as follows:-

· Hardware markets in which the hardware is, or has historically been, more difficult to maintain than the software have tended to bundle systems software support. The principal market to which this factor can be applied is the large systems market.

· Plug compatible manufacturers within the large systems market have used the bundling of software support to provide services which add value to the basic service contract for their customers. The principal motive behind this tactic has been to use the service concept in order to develop differential advantage.

· Customers who anticipate cuts in systems budgets have expressed a preference for bundled software support to ensure that a level of support can be maintained.

The principal factors in favour of unbundling can be considered as follows:-

· The increasing complexity of systems software and the level of maintenance required to support it, combined with the reducing complexity of the hardware maintenance process, will encourage the development of software support as an independent entity.

· The pressure on vendors to establish alternative sources of revenue to compensate for the decline in growth of the hardware maintenance market provides a powerful incentive to unbundle software support, which is expected to be a growth market throughout the first half of the decade.

· The importance of software support centres to the service quality image of the vendor implies the need to ensure that an adequate level of investment in such centres is maintained. The adoption of an unbundled support programme permits the treatment of software support centres as profit centres thereby facilitating the development of adequate investment criteria under which money can be spent.

Of these factors, it is estimated that the strongest influence will be generated by the requirement to develop revenue from alternative service products. Although the factors that specifically apply to the large systems market will persist, it is tentatively concluded that vendors will move towards the unbundling of support.

V

Skills Issues

V Skills Issues

A
Introduction

The critical part played by systems software in the smooth running of computer systems, coupled with the increasing complexity of the systems platform, obviously implies that the skills and availability of software support personnel are of key interest to end users. It is scarcely surprising, therefore, that the level of interest expressed by users in the software skills of engineers has averaged over 8.9 on a scale of 0-10 over the four year period to 1990.

Despite the consistently high level of importance attached to the issue of software skills, a degree of dissatisfaction is evident within the user base. Furthermore, the indications are that the level of concern felt by customers is on the increase. It is apparent that a perceived worsening of the level of software skills available to the user could lead to a significant decrease in overall customer satisfaction levels. The purpose of this section is, therefore, to analyse the causes of the concerns being expressed and to look at some possible courses of action to alleviate the situation.

Exhibit V-1 places the skills issue within the overall status of concern in the area of systems software support and highlights the major areas of dissatisfaction expressed by users. The data was obtained from a sample of 30 respondents interviewed in depth in order to provide a level of detailed information to qualify the trends indicated by the overall user surveys conducted by **INPUT**.

Expressions of dissatisfaction expressed by almost 25% of the sample provide ample evidence that problems do exist. However, the existing level of satisfaction should be considered within the broader context of a gradual worsening of the position over a four year period. As one of the three principal causes of concern within the arena of systems software support, a considerable degree of importance should be attached to this issue.

Exhibit V-1

Principal Areas of Dissatisfaction
Skills Issues
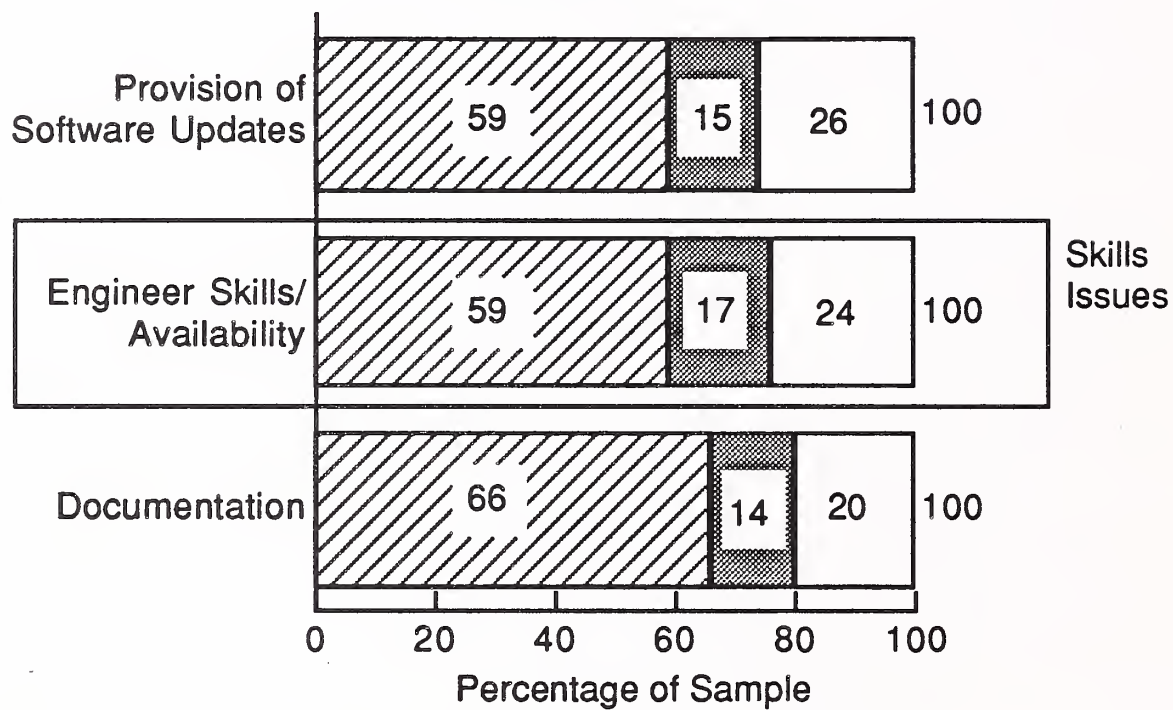
Provision of Software Updates	59	15	26	100
Engineer Skills/ Availability	59	17	24	100
Documentation	66	14	20	100

Skills Issues

Percentage of Sample

☐ Dissatisfied

▨ No Comment Made

▨ Satisfied

Sample Size: 30

          CE-SW1

B
Trend Analysis

An analysis of the trends in user attitudes towards software support skills is presented in Exhibit V-2. The data is in the form of a weighted average of ten of the leading hardware vendors and the individual company trends are shown in Exhibits V-3 to V-12.

Exhibit V-2 reinforces two key points:

· The average level of importance attached to the issue of software support skills by the user community is consistently rated at around 9 on a scale of 0-10. This issue must, therefore, be regarded as being of key concern to the customer and emphasises again the level of importance which should be attached to the issue of software support skills.

· The weighted average levels of satisfaction returned for 1987 and 1988 fall within the range of overall user satisfaction. However, the key point to note is that the trend is worsening and is now showing that a level of user concern exists. It is currently too early to conclude that the reduction of the rating of 1.2 in 1989 to 1.0 in 1990 marks the beginning of an improving picture or is simply part of a long run declining trend.

Exhibit V-2

Engineers' Skills—Trend Analysis of User Importance Ratings and Levels of Satisfaction—Weighted Average

Importance Rating

10 8.8   9.0   9.0   8.9   3 Δ SI

8

6

4   1.2
     0.9   1.0
0.7

2

0   1987   1988   1989   1990   0

Importance Rating

Δ SI

Exhibit V-3

Engineers' Skills—Trend Analysis of User Importance Ratings and Levels of Satisfaction—Amdahl

Importance Rating

Importance Rating

ΔSI

Sample Size:
1987	—
1988	79
1989	80
1990	105

Note: No data available for 1987

Exhibit V-4

Engineers' Skills—Trend Analysis of User Importance Ratings and Levels of Satisfaction—Bull

Importance Rating

	1987	1988	1989	1990
Importance Rating	8.9	8.9	9.0	8.7
Δ SI	0.9	0.9	1.1	0.9

━━━━━━━━ Importance Rating

ııııııııııı   Δ SI
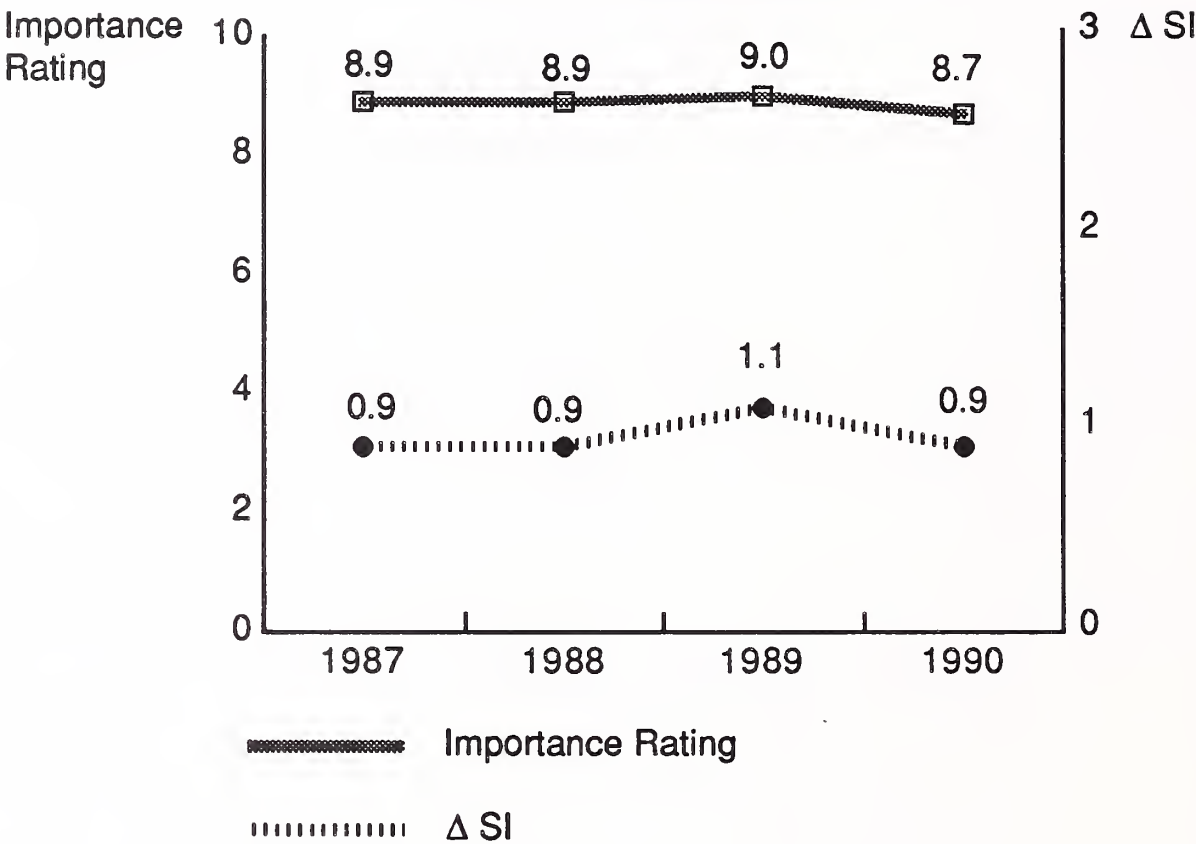
Sample Size:　1987　　115
　　　　　　　1988　　146
　　　　　　　1989　　128
　　　　　　　1990　　 82

Exhibit V-5

Engineers' Skills—Trend Analysis of User Importance Ratings and Levels of Satisfaction—Digital

Importance
Rating

8.9	8.9	9.1	8.9

0.7   0.9   0.9   1.1

1987   1988   1989   1990

▬▬▬▬▬▬ Importance Rating

|||||||||||||| Δ SI
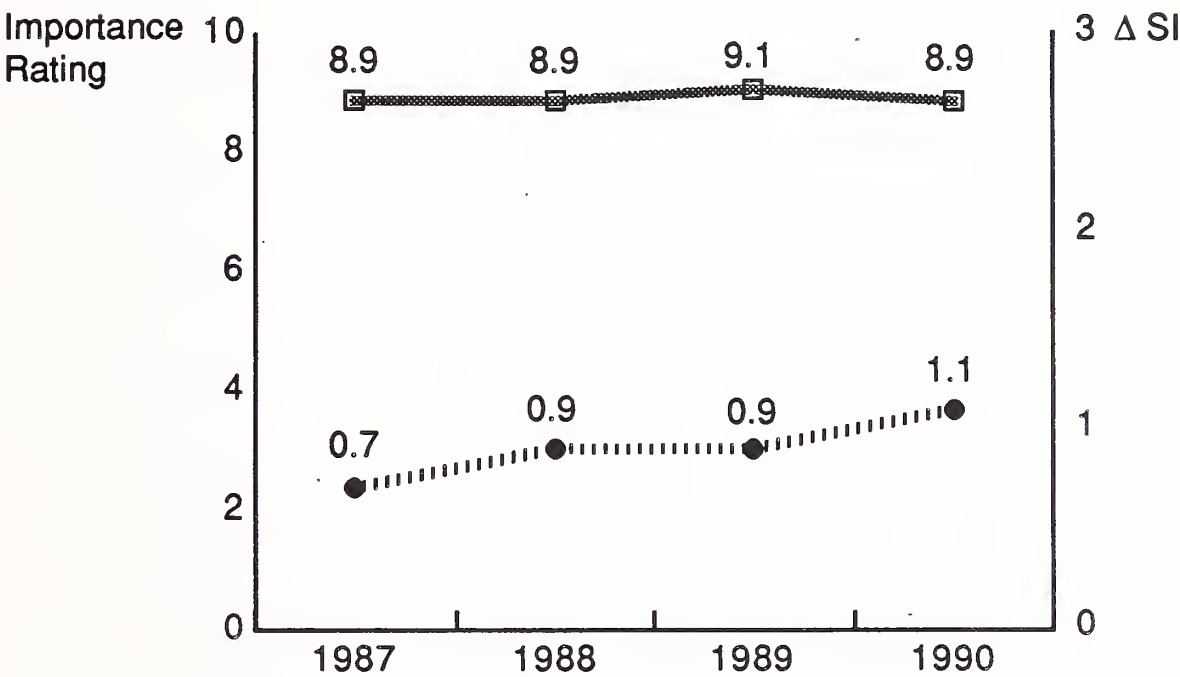
Sample Size: 1987   191
              1988   217
              1989   134
              1990   91

Exhibit V-6

Engineers' Skills—Trend Analysis of User
Importance Ratings and Levels of
Satisfaction—Hewlett-Packard

Importance
Rating

	1987	1988	1989	1990
Importance Rating	8.8	8.8	9.2	8.9
Δ SI	0.3	0.7	1.3	1.1

▬▬▬▬ Importance Rating

ııııııııııı Δ SI
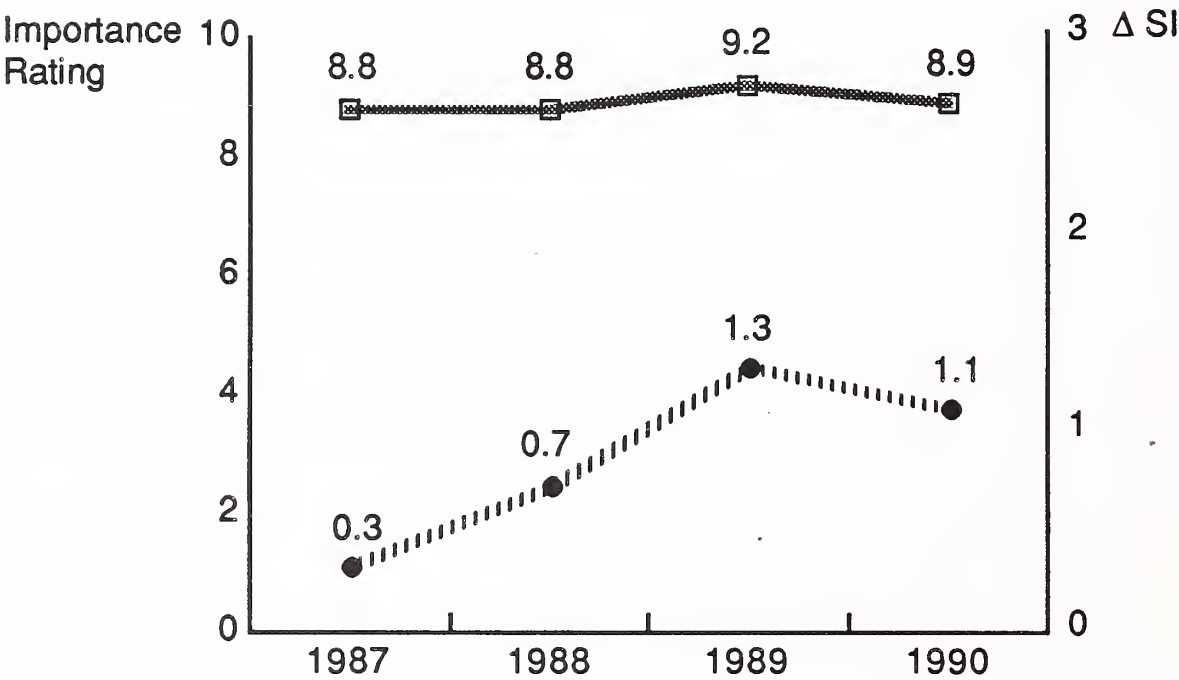
Sample Size: 1987   96
             1988   109
             1989   92
             1990   81

Exhibit V-7

Engineers' Skills—Trend Analysis of User Importance Ratings and Levels of Satisfaction—IBM
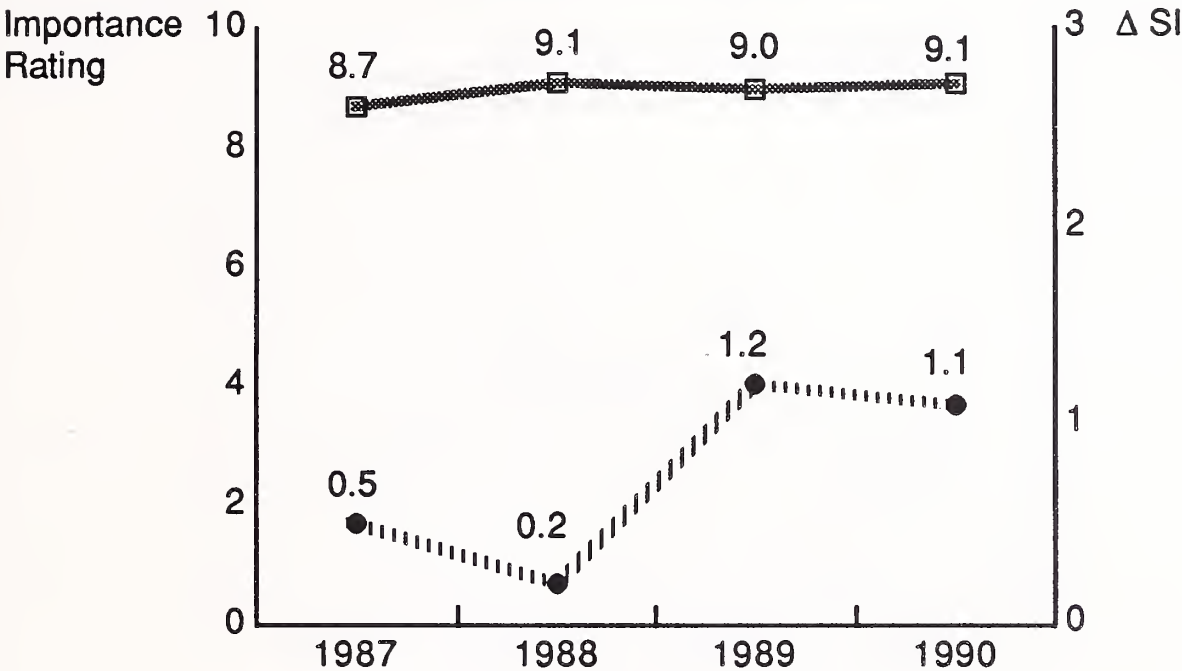
Importance
Rating

Sample Size:
1987	210
1988	237
1989	254
1990	257

Exhibit V-8

Engineers' Skills—Trend Analysis of User Importance Ratings and Levels of Satisfaction—ICL
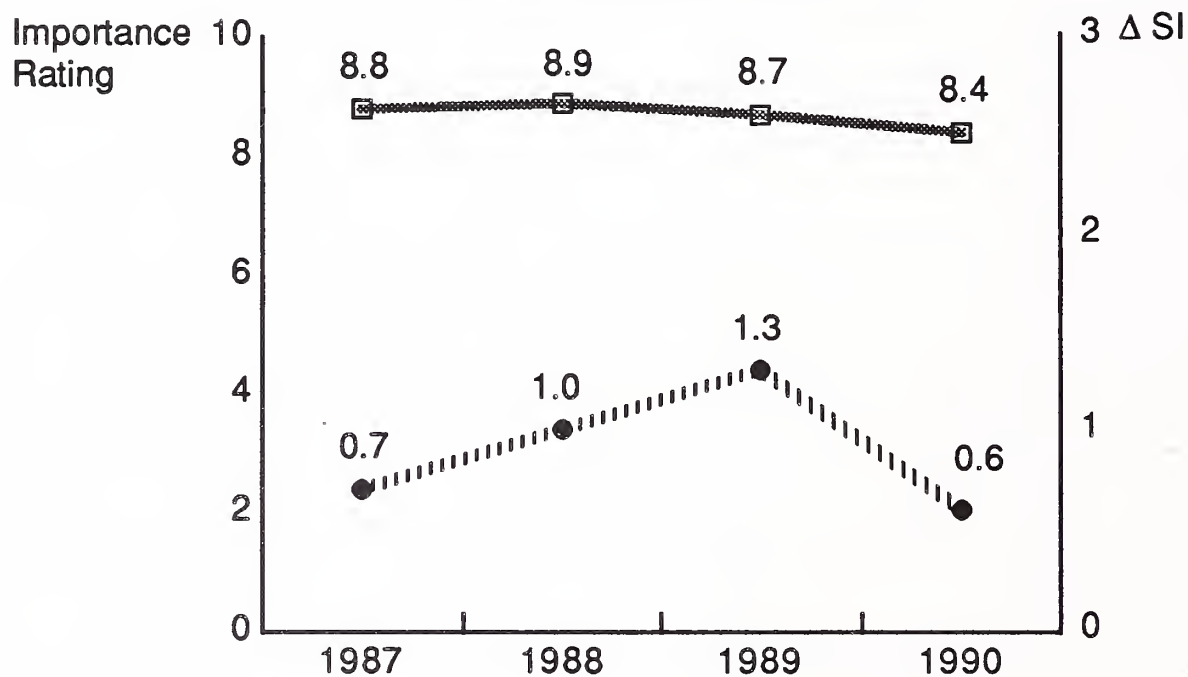
Sample Size: 1987   197
              1988   203
              1989   185
              1990   198

Exhibit V-9

Engineers' Skills—Trend Analysis of User Importance Ratings and Levels of Satisfaction—NCR

Importance Rating

8.7   9.2   9.3   9.2

1.4

1.0

0.6   1.2

1987   1988   1989   1990

▬▬▬▬▬▬▬▬ Importance Rating

ııııııııııı Δ SI
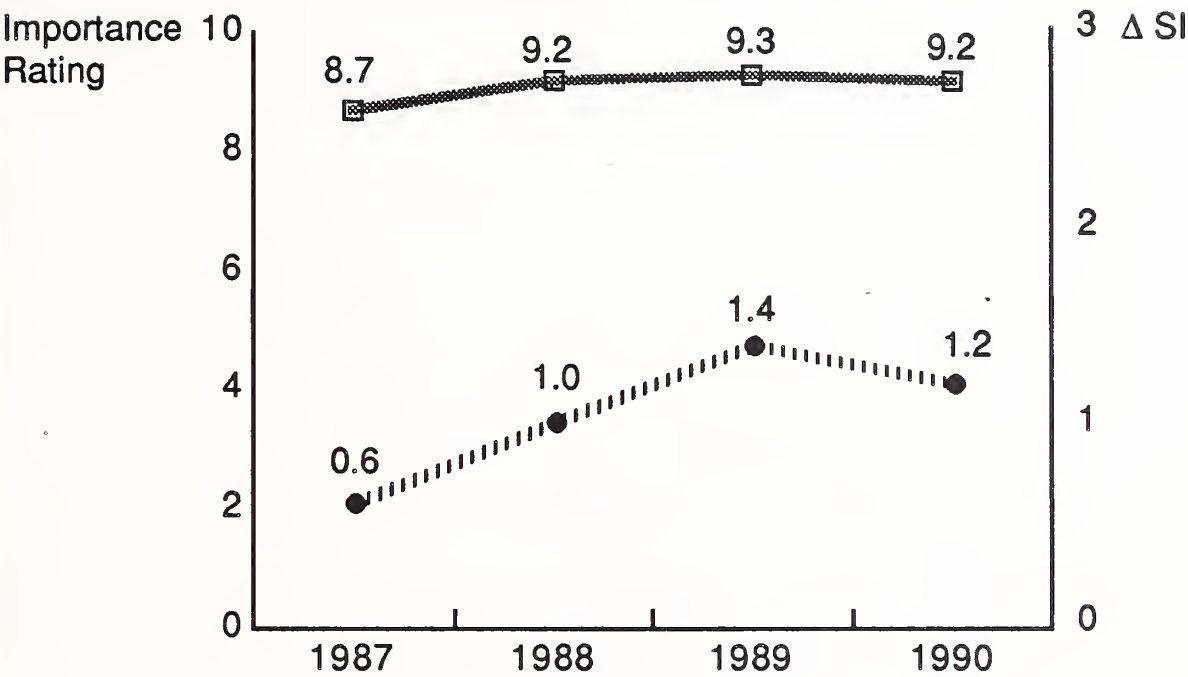
Sample Size: 1987   121
              1988   88
              1989   61
              1990   36

Exhibit V-10

Engineers' Skills—Trend Analysis of User Importance Ratings and Levels of Satisfaction—Siemens
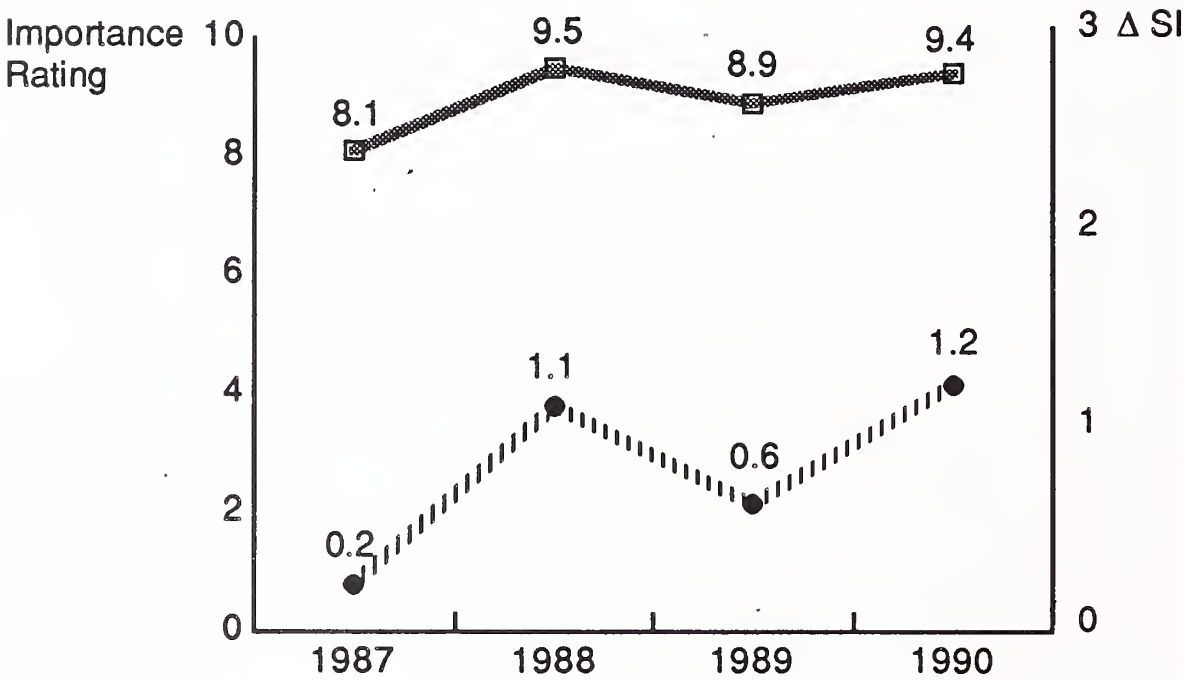
Importance Rating

Sample Size:	1987	53
	1988	31
	1989	49
	1990	25

Exhibit V-11

Engineers' Skills—Trend Analysis of User Importance Ratings and Levels of Satisfaction—Unisys
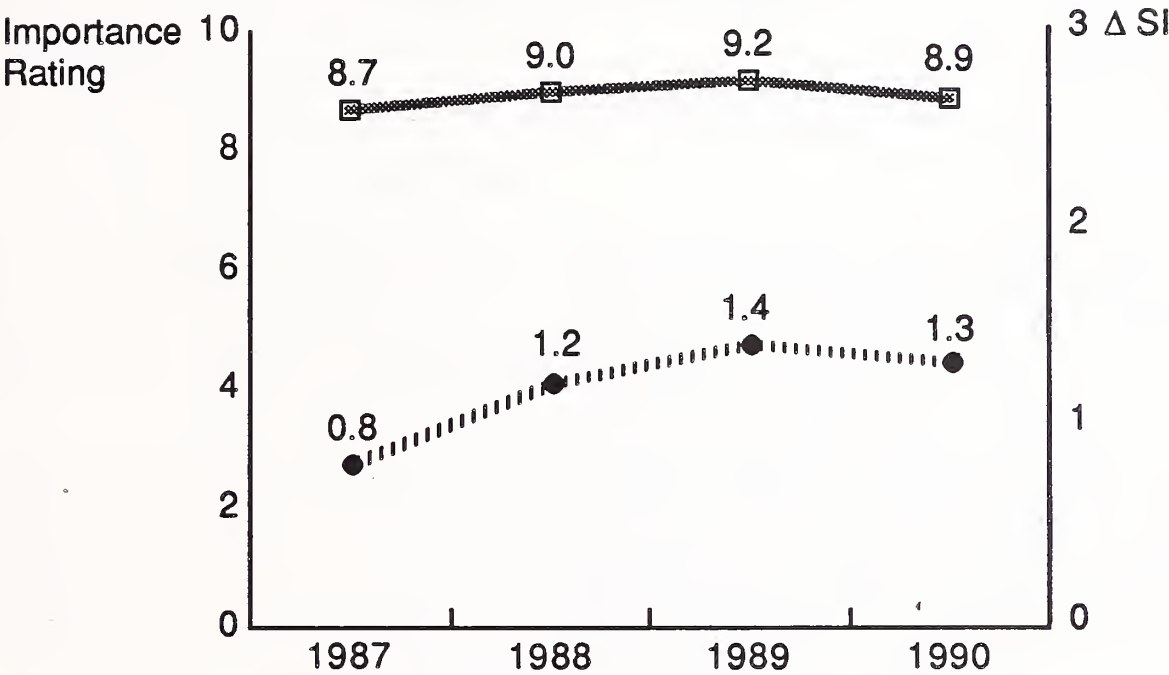
Sample Size: 1987   111
              1988   179
              1989   130
              1990   77
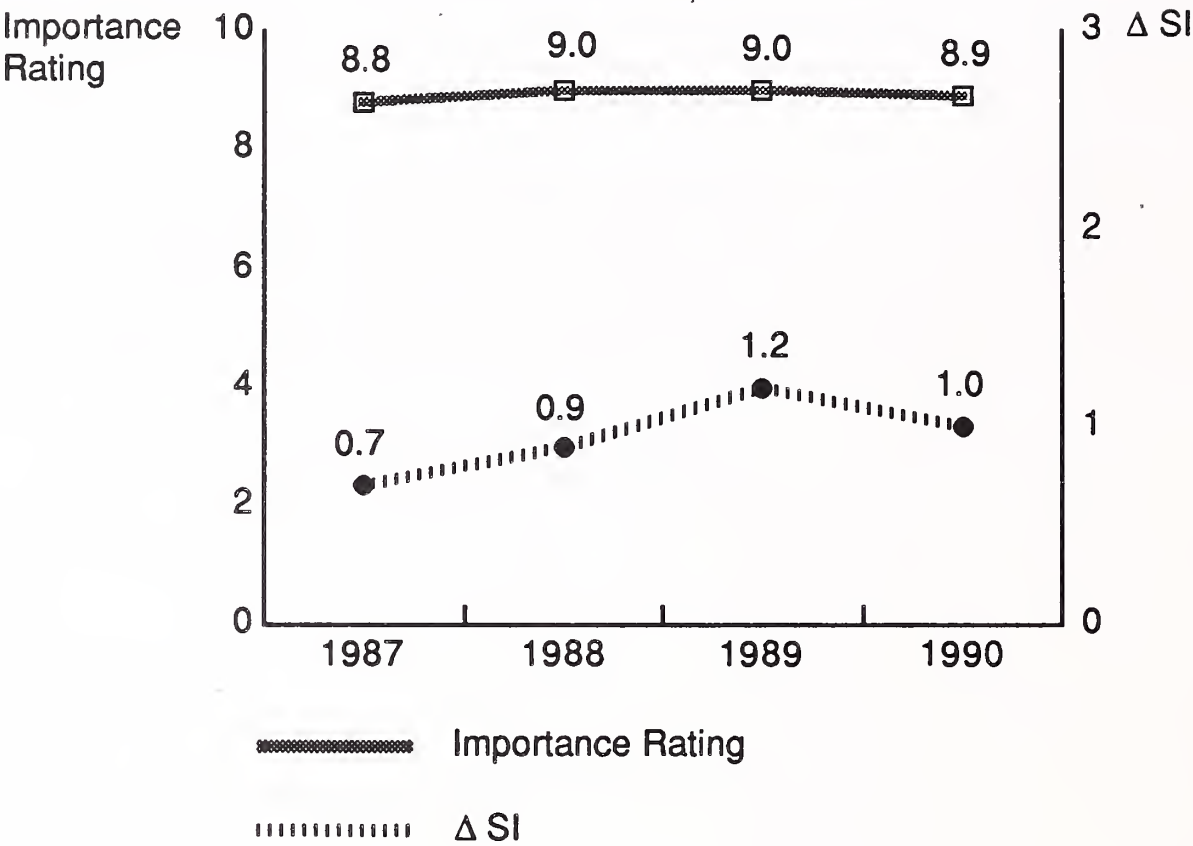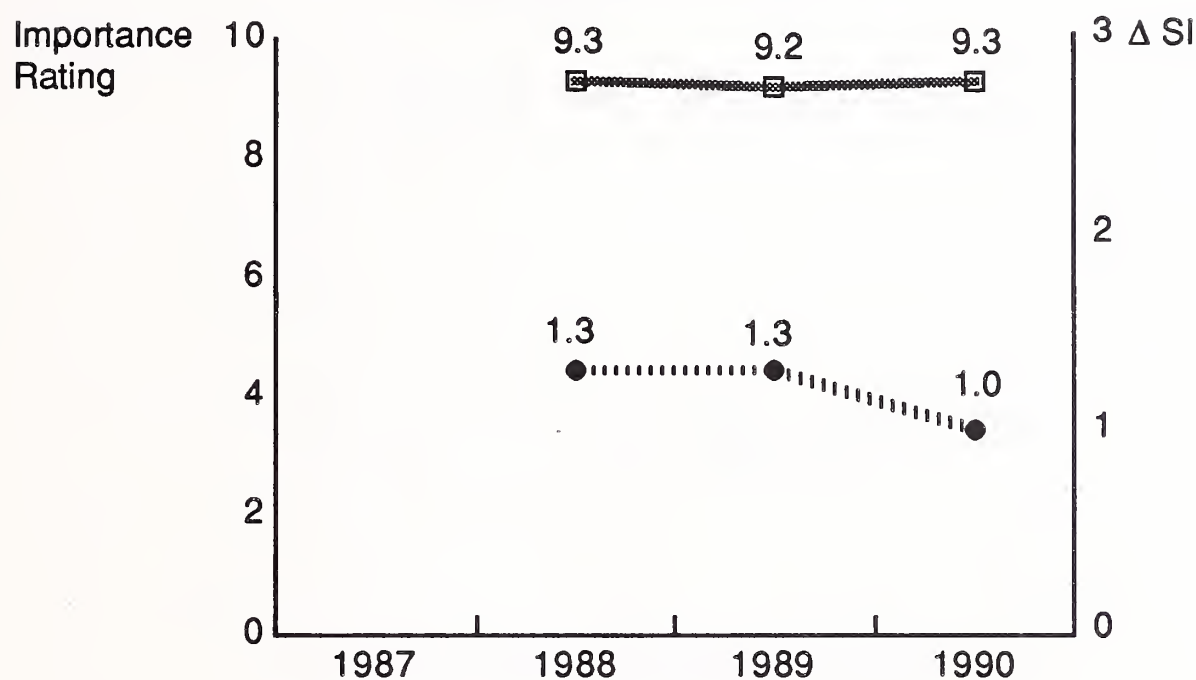
Exhibit V-12

Engineers' Skills—Trend Analysis of User Importance Ratings and Levels of Satisfaction—Wang

Importance Rating 10

| 9.1 | 9.2 | 9.3 | 3 Δ SI |

1.7

1.2

1.0

| 1987 | 1988 | 1989 | 1990 |

▬▬▬▬▬   Importance Rating

ıııııııııııı   Δ SI
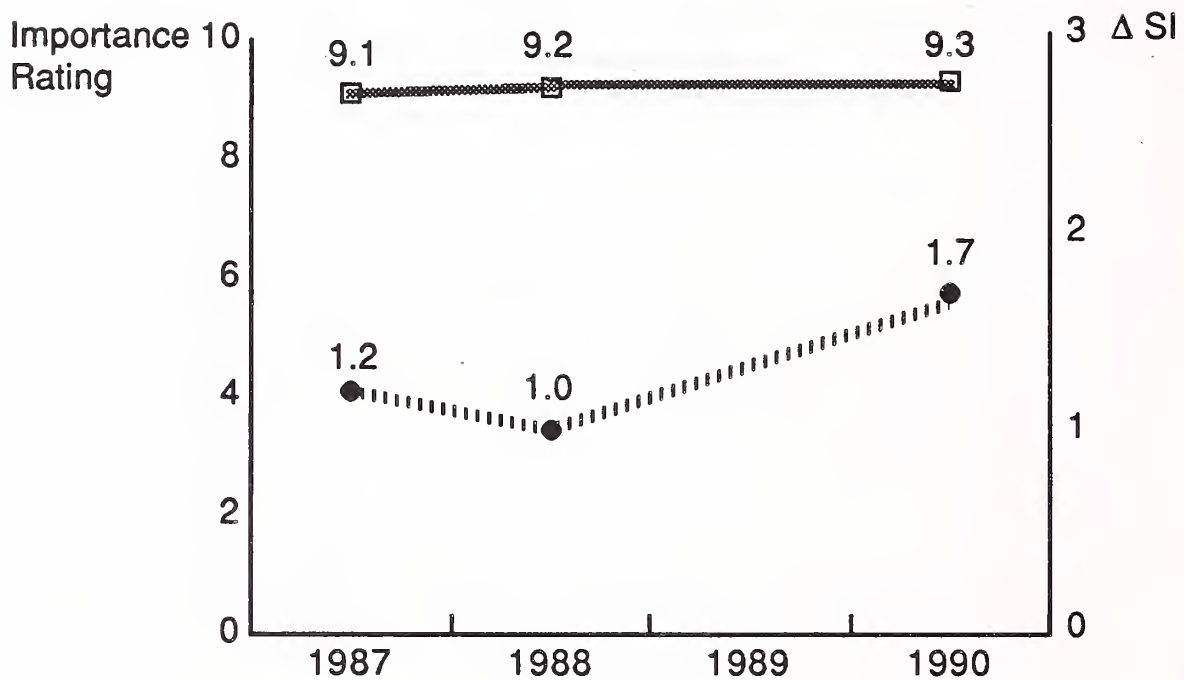
Sample Size: 1987   59
              1988   200
              1989   —
              1990   82

Note: No data available for 1989

C
Issues

The principal areas of concern with system software support skills are illustrated in Exhibit V-13. Although the level of satisfaction is consistent with that returned by users on being asked to give their general impressions of the support they receive, it is worth noting that on being asked to specifically consider issues relating to skills levels, the proportion of uncommitted respondents shrank from 17% to 7% indicating that particular issues are generating a level of concern.

The major causes of dissatisfaction are analysed below:

1. The Software Skills of Field Engineers

There is a perception within the user community that people traditionally regarded as hardware technicians will have limited software skills. Respondents have frequently commented on the fact that field engineers are never involved in the resolution of software problems. Two particular issues arise from this situation.

· A number of customers have commented that they have guided or trained the vendor's field personnel in the use of systems software. Although it might be argued that hardware support engineers can hardly be expected to possess a similar level of familiarity with software products to that possessed by a user's systems operations staff, there is a distinct link between comments of this nature and a low overall opinion of the software support capabilities of the vendor.

· Users have reported the existence of a "grey" area between the responsibilities of hardware and software support leading to obvious delays in resolving a given problem. Indeed, one particular user reported instances of disputes between the two wings of the vendors organisation. Besides having a severe effect on the operational ability of the servicing vendor, the negative effects of such instances on the customers perception of the supplier hardly need stating.

2. Quality of Service

Two problems were cited as impacting upon the perceived quality of service:

· Particular problems exist in the support of old or obsolete products. A number of customers who are using older configurations volunteered complaints at the quality of software support they receive. In one particular instance, the user had decided to migrate to an alternative hardware vendor and quoted the lack of support received as one of the factors contributing to the decision. The maintenance of effective levels of support on a small base of obsolete equipment is obviously a difficult and expensive task. However, the evidence suggests that this particular issue contributes significantly to user satisfaction and, in isolated cases, has contributed to the complete loss of an account.

· The attitude of users towards telephone helplines remains mixed but it can be concluded that opinions vary between critical and neutral. Respondents who praise the quality of service they receive will point to the ability of their field contacts. No respondent felt it necessary to draw attention to the excellence of the helpline service. Two principal issues are encountered in using a helpline.

- Users find it difficult to locate individuals with the appropriate expertise. Users commonly perceive software support helpline as being the preserve of "backroom boffins" who are buried deep within the vendors organisational structure and a considerable level of frustration is generated by the difficulties encountered in finding them.

- Secondly, respondents take the view that the personnel staffing software helplines are too far removed from commercial realities and have little appreciation of the business context in which the service they provide fits. Users conclude that this lack of commercial awareness adversely affects the ability of the vendor to provide a commercially sympathetic level of service.

Exhibit V-13

Systems Software Support Skills
Causes of Dissatisfaction

No Comment

Poor Overall

6%

14%

59% Satisfactory

Response/
Availability of
Appropriately
Qualified Staff

21%
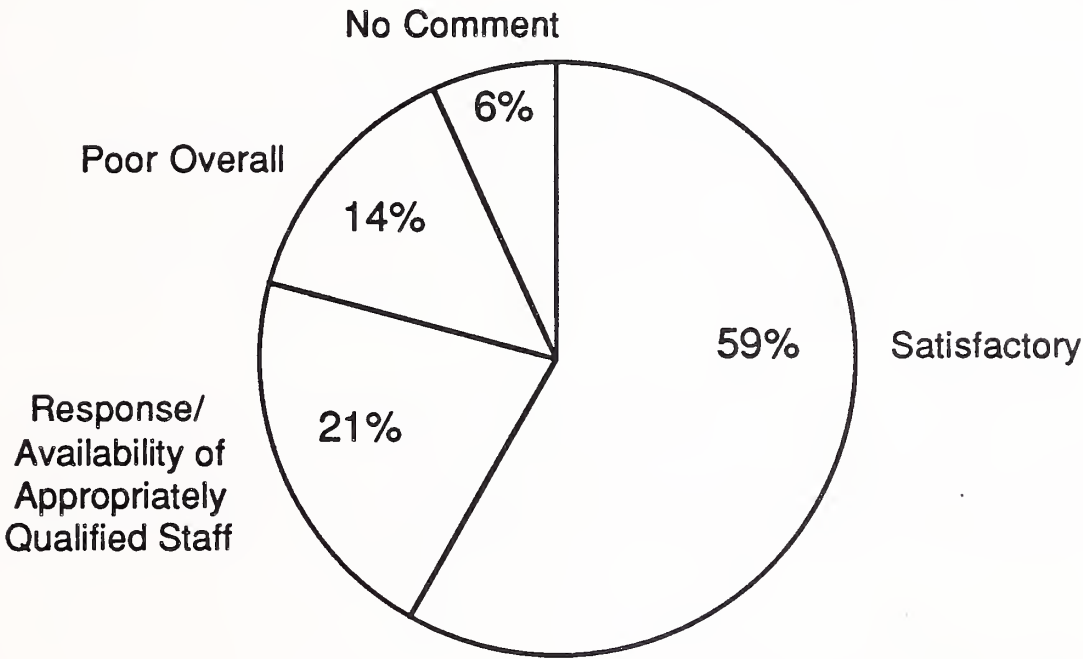
D
Tactical Improvements

User responses indicate that the preferred means of managing systems software support is through the use of a key site contact who possesses the consultancy and problem management skills to credibly maintain the required level of support. A level of dissatisfaction is generated by the low level expectations users have of the software skills of field engineers, combined with the difficulties they experience in locating personnel with the required level of software expertise.

The reduced requirement for field hardware engineers caused by the well documented increase in the reliability levels of equipment has been a factor influencing a number of vendors to develop software and problem management skills within their technical field staff in order to meet the demand for a competent local contact who is able to manage the resolution of both hardware and systems software problems. In addition to meeting the demands of the user, the evolution of field staff into competent problem managers offers a number of advantages to vendors.

- The existence of a body of well qualified technical problem managers facilitates the provision of multi-vendor servicing offerings. In instances where vendors are offering themselves as the single point of contact for the total servicing requirements of a multi-vendor installation, field problem management skills are of primary importance particularly in cases where sub-contractors are employed.

- The adoption of outsourcing for the routine servicing of hardware by some vendors is clearly supported by the existence of field personnel able to retain management control of the process and to manage the resolution of problems that arise.

- The introduction of field support personnel with both well developed systems software support skills and an understanding of the customer's business requirements will go a long way towards negating the complaint that the providers of software support have little understanding or awareness of the commercial pressures within which the customer is operating.

Although the responsiveness and accessibility of telephone hotlines is a source of user dissatisfaction, it is generally accepted that the medium provides an effective means of utilising scarce specialist software expertise. In order to increase the accessibility of such expertise to the user community, two specific areas of improvement should be considered.

- Several vendors are utilising telecommunications technology to reduce the level of bureaucracy inherent in the traditional fault logging process. By allowing the user to key in fault calls directly and transmit the call electronically to the service centre, an accurate description of the problem can be passed directly to the relevant expert without the need to go through the intermediate stages of fault logging and screening. This approach ensures that the first point of contact for a given software problem will be the specialist most able to provide the solution. In addition to greatly reducing the distance between the customer and the actual provider of the service, the application of technology to the logging process reduces the need to maintain a costly fault logging facility within the structure of the hotline.

- Although the desirability of encouraging users to screen their own hotline calls before passing them to the vendor is now commonly accepted, it should be stressed that assisting customers to qualify their own calls allows the hotline service to focus more effectively on genuine problems rather than assisting in the identification of user errors. The consequent reduction in the need to filter such calls greatly increases the accessibility and productivity of software expertise.

In addition to specifically satisfying the points raised by users, the focus applied to both the development of systems support expertise in the field and the improvement of accessibility to relevant expertise within the hotline function will go a considerable way towards reducing the problems inherent in supporting obsolete products. By evolving field support personnel into technically skilled problem managers, focus will be retained more easily on the specific software support requirements of the customer.

E
Conclusions

The issue of systems software support skills is regarded as being of very significant importance to users. It is rated at a level of interest of approximately 9 on a scale of 0-10.

The level of satisfaction generated by the issue has shown a declining trend over the 4 year period to 1990 and is at a level where it is giving cause for concern.

Three principal factors have been identified as the major causes of concern:-

- Field engineering personnel do not have adequate systems software support skills. Although customers have a low level of expectation of field software skills, dissatisfaction is generated both because users consequently find adequate software support difficult to find and because there are occasions where users find it necessary to train field staff on aspects of software.

- Problems are encountered by users in gaining access to the appropriate level of software support expertise through telephone helpline services. Complaints are made both at the bureaucracy surrounding the fault logging process and the call qualifying stage of the operation. Users also feel that software specialists manning the helplines are too far removed from the commercial realities of the users operation.

- Users of old or obsolete products are dissatisfied at the quality of systems software support available to them. In on particular instance this factor was quoted as one of the factors which persuaded a user to migrate to an alternative hardware supplier.

Two particular courses of action can be considered in order to reduce the dissatisfaction generated by these particular issues.

- A number of vendors are broadening the skills base of their field support personnel to include systems software support capability. By undergoing this process the role of the hardware engineer will evolve into that of a problem manager capable of managing the resolution of the complete range of technical problems. The provision of a point of contact for technical problem solving will reduce the sense of inaccessibility expressed by users. The development of problem management capability will also assist in improving the understanding of the software support requirements of customers, including those using old equipment.

- Telephone helpline services should become more accessible by reducing the level of bureaucracy encountered in logging calls. Some vendors are moving to a procedure whereby users log their own calls and a telecommunications link is utilised to transmit the fault record to the vendors service centre. The call can then be directed immediately to the appropriate technical expert who then becomes the first point of contact for the user.

VI

Documentation Issues

VI Documentation Issues

A
Introduction

User research has indicated that a level of dissatisfaction exists with the quality of systems documentation provided by vendors to the user base. Coupled with this level of dissatisfaction is the fact that customers attach significant importance to the quality of documentation they receive. Typically they are returning a figure of over 8.5 when asked to rate the importance of documentation on a scale of 0-10.

Exhibit VI-1 places the issue of documentation into the context of the major areas of concern expressed by users within the overall area of systems software support. The data was obtained from a sample of 30 users interviewed in depth in order to provide a level of detailed data to support the trends indicated by the overall user surveys conducted by **INPUT**. The fact that 20% of respondents expressed dissatisfaction with the service they receive illustrates the extent of the problem.

The combination of a high importance rating and a consistent level of dissatisfaction gives rise to a level of concern and the issue is obviously one which requires a degree of attention on the part of vendors. The purpose of this section is to analyse the factors underpining these expressions of concern and to examine possible courses of action that might be taken to improve the situation.

Exhibit VI-1

Principal Areas of Dissatisfaction
Documentation Issues

Provision of Software Updates	59	15	26	100
Engineer Skills/ Availability	59	17	24	100
Documentation	66	14	20	100	Documentation Issues

0   20   40   60   80   100

Percentage of Sample

☐ Dissatisfied

▨ No Comment Made

▨ Satisfied

Sample Size: 30

            CE-SW1

B
Trend Analysis
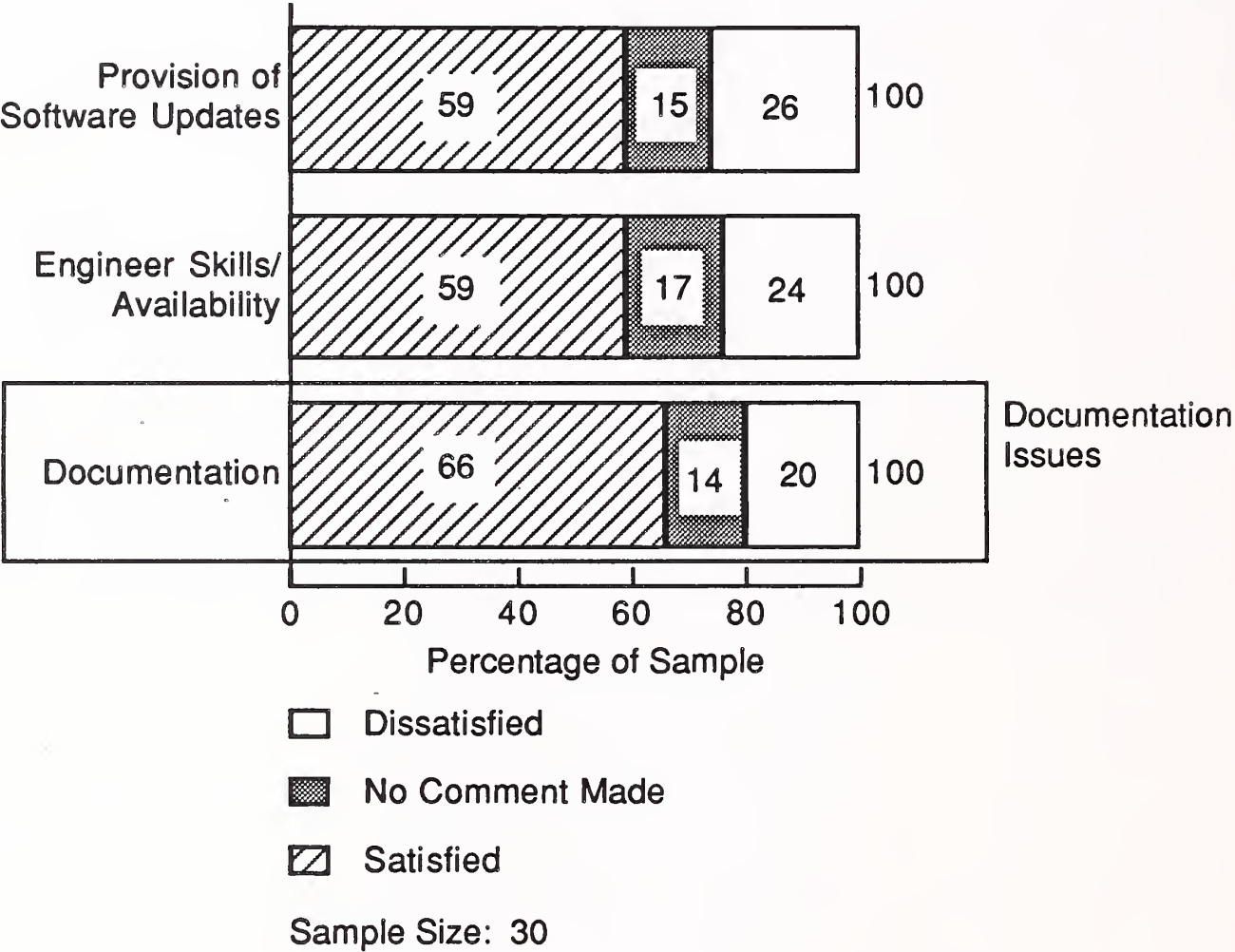
An analysis of the trends in user attitudes towards documentation is presented in Exhibit VI-2. The data is in the form of a weighted average of ten of the leading hardware vendors and the individual company trends are shown in Exhibits VI-3 to VI-12.

Exhibit VI-2 reinforces two key points:

· The level of importance attached to documentation by the user community is consistently rated at 8 or higher on a scale of 0-10. Documentation is considered to be of very considerable importance by customers.

· Although a perceptible improvement in the satisfaction level was recorded for 1990, it is too early to conclude that the worsening trend exhibited over previous years has been reversed. The chief conclusion to be derived from the satisfaction index trends is that users are consistently expressing a level of dissatisfaction between "concerns and worries" and "real dissatisfaction."

The combination of a high importance rating and a recorded level of dissatisfaction firmly indicates that the issue of documentation should not be underestimated and that problems in this area can have a definite impact on overall satisfaction levels felt by users.

Exhibit VI-2

Systems Software Documentation
Trend Analysis of User Importance Ratings and
Levels of Satisfaction—Weighted Average
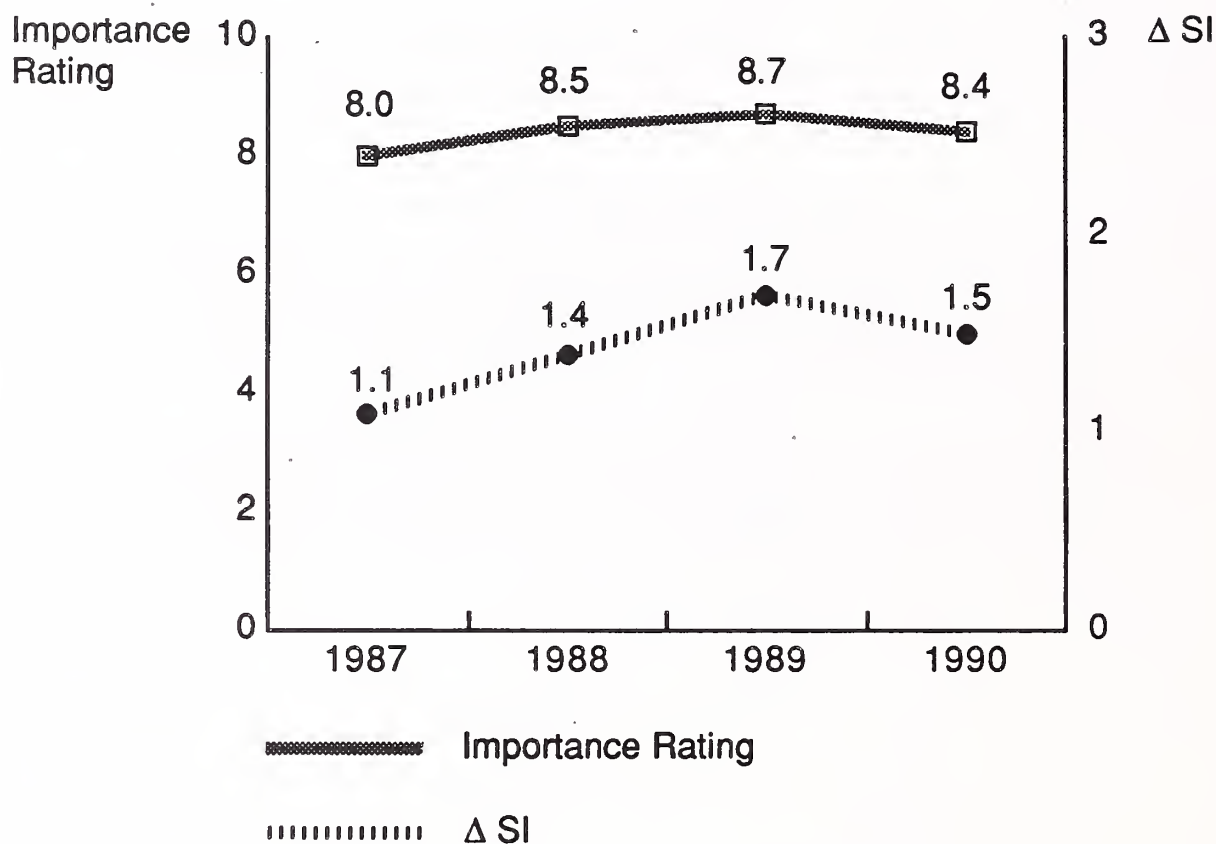
Exhibit VI-3

Systems Software Documentation
Trend Analysis of User Importance Ratings and
Levels of Satisfaction—Amdahl

Importance Rating

Δ SI

Sample Size:

1987	—
1988	79
1989	80
1990	102

Note: No data available for 1987

Exhibit VI-4

Systems Software Documentation
Trend Analysis of User Importance Ratings and Levels of Satisfaction—Digital

Importance
Rating

10

8.2   8.8   8.8   8.7

8

6   1.5

           1.2   1.3

4   1.0

2

0

1987   1988   1989   1990

3 Δ SI

2

1

0

▬▬▬▬▬ Importance Rating

ııııııııııı Δ SI
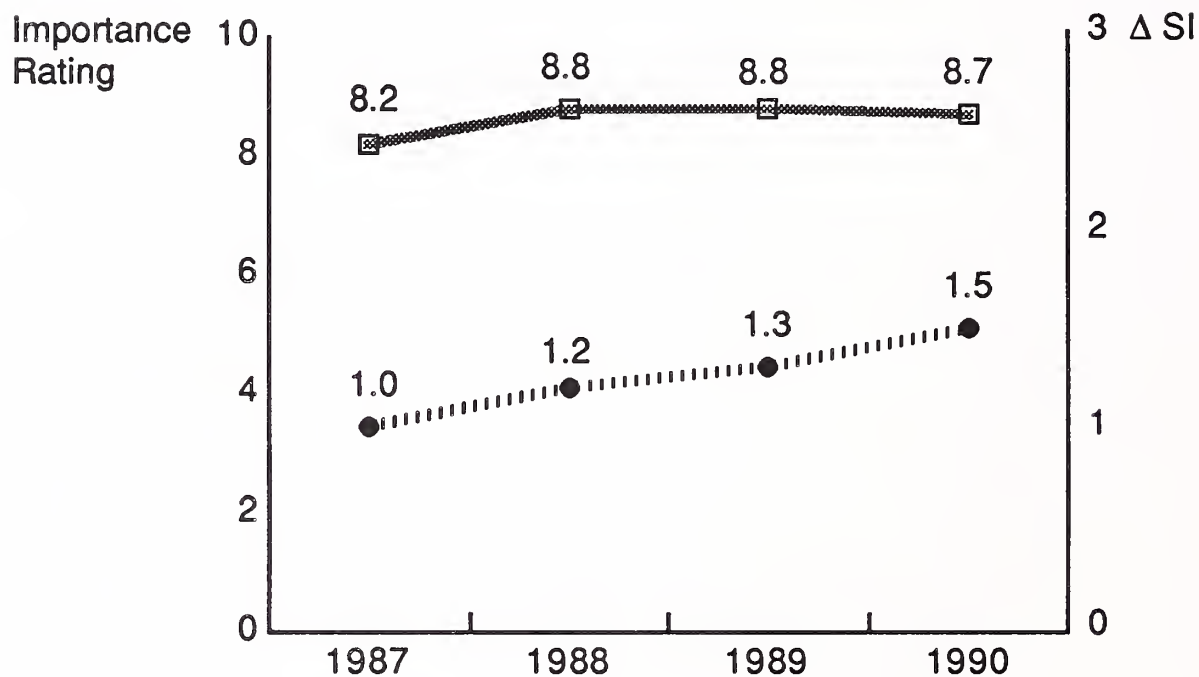
Sample Size:	1987	191
	1988	217
	1989	134
	1990	91

        CE-SW1

Exhibit VI-5

Systems Software Documentation
Trend Analysis of User Importance Ratings and
Levels of Satisfaction—Hewlett-Packard

Importance Rating

Δ SI
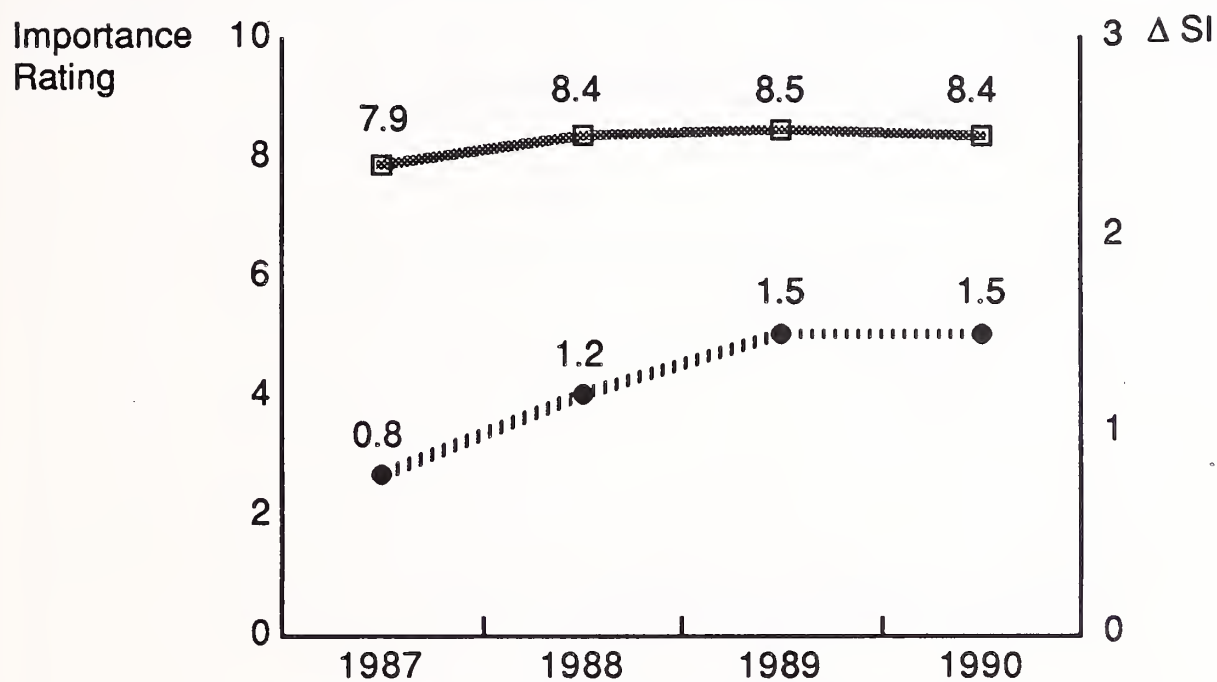
Sample Size: 1987   96
                1988   109
                1989   92
                1990   81

Exhibit VI-6

Systems Software Documentation
Trend Analysis of User Importance Ratings and
Levels of Satisfaction—Bull

Sample Size: 1987   115
            1988   146
            1989   128
            1990   82

CE-SW1
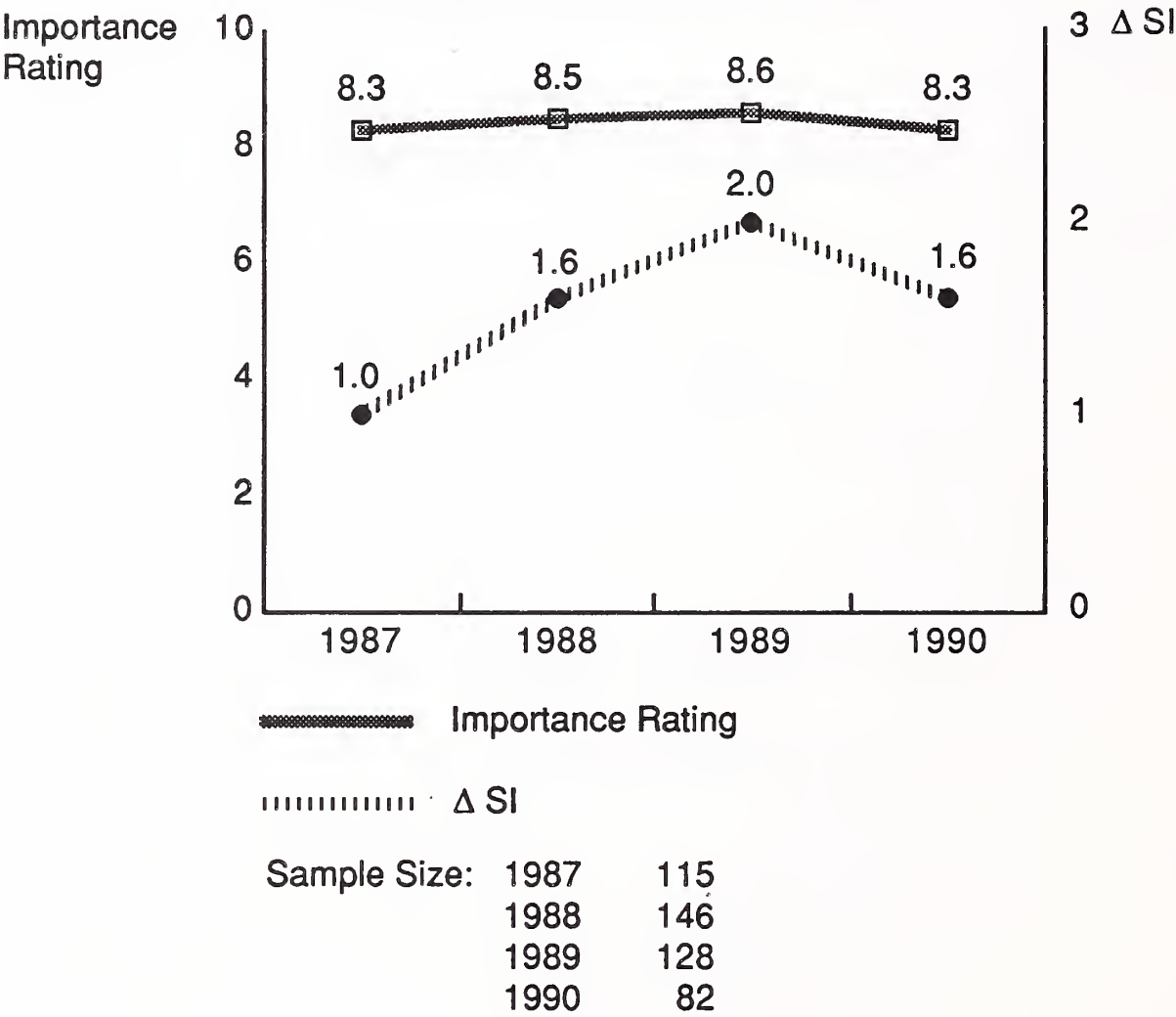
Exhibit VI-7

Systems Software Documentation
Trend Analysis of User Importance Ratings and
Levels of Satisfaction—IBM

Importance 10
Rating

	1987	1988	1989	1990
Importance Rating	8.2	8.4	8.6	8.6
Δ SI	0.9	1.1	1.4	1.3

3 Δ SI

━━━━━━━   Importance Rating

ıııııııııı   Δ SI
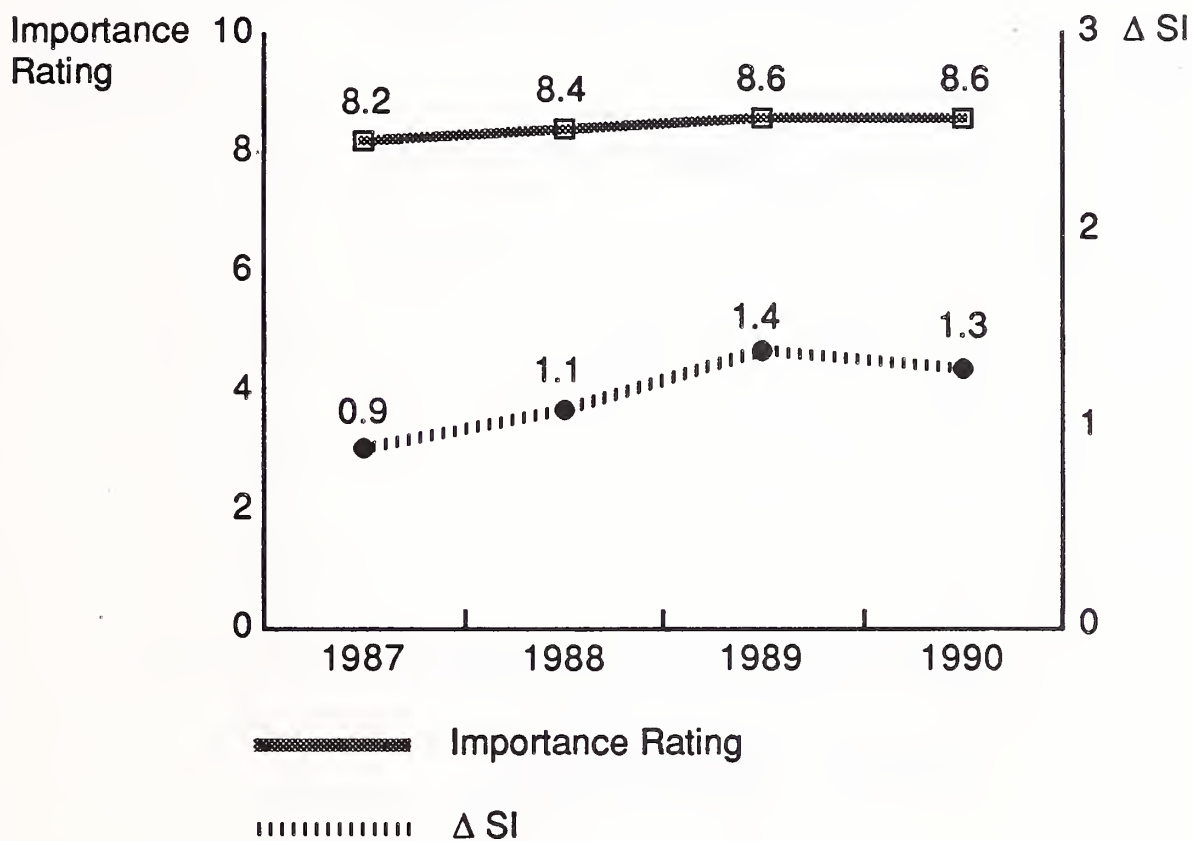
Sample Size: 1987   210
                1988   237
                1989   254
                1990   257

Exhibit VI-8

Systems Software Documentation
Trend Analysis of User Importance Ratings and
Levels of Satisfaction—ICL

Sample Size: 1987   197
               1988   203
               1989   185
               1990   198

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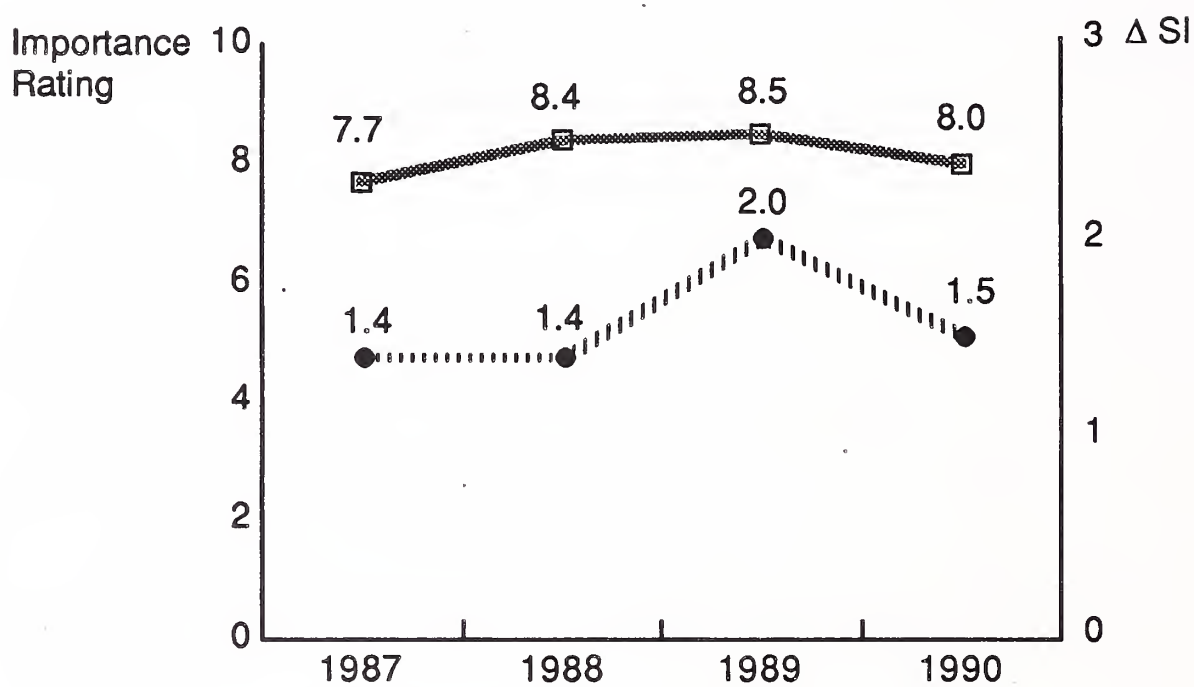
Exhibit VI-9

Systems Software Documentation
Trend Analysis of User Importance Ratings and
Levels of Satisfaction—NCR

Importance Rating

△ SI
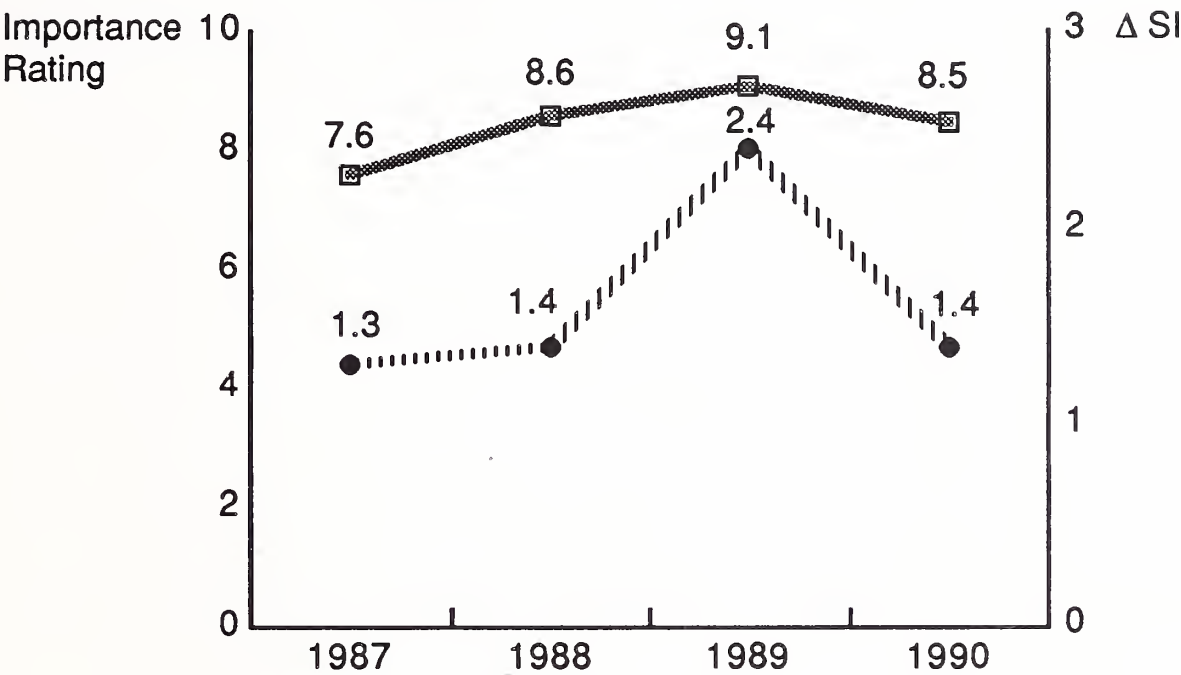
Sample Size: 1987   121
1988   88
1989   61
1990   36

Exhibit VI-10

Systems Software Documentation
Trend Analysis of User Importance Ratings and Levels of Satisfaction—Siemens

Importance Rating

ΔSI

8.3   8.8   8.9   9.3

0.7   1.0   1.4   1.4

1987   1988   1989   1990

■■■■■■■■■■■■ Importance Rating

ııııııııııı ΔSI

Sample Size: 1987   53
               1988   31
               1989   49
               1990   25

    CE-SW
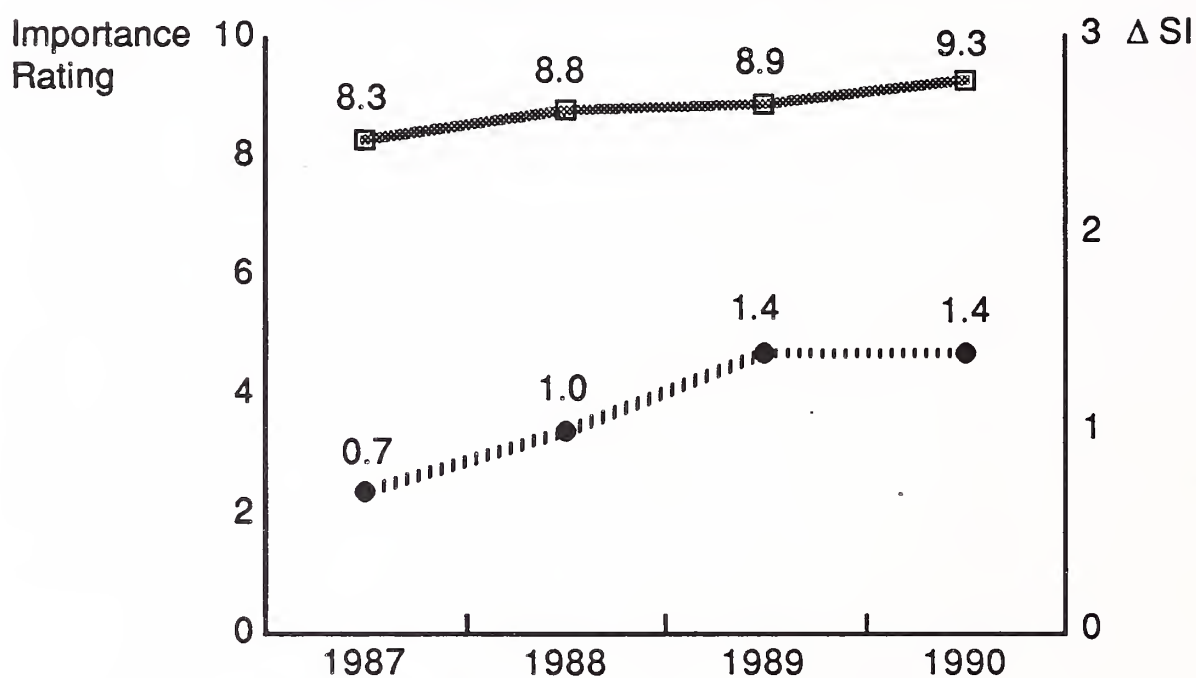
Exhibit VI-11

Systems Software Documentation
Trend Analysis of User Importance Ratings and
Levels of Satisfaction—Unisys

Importance 10
Rating

8.4   8.6   8.8   8.4

1.4   1.6   1.6   1.4

1987   1988   1989   1990

━━━━━ Importance Rating

ııııııııııı Δ SI
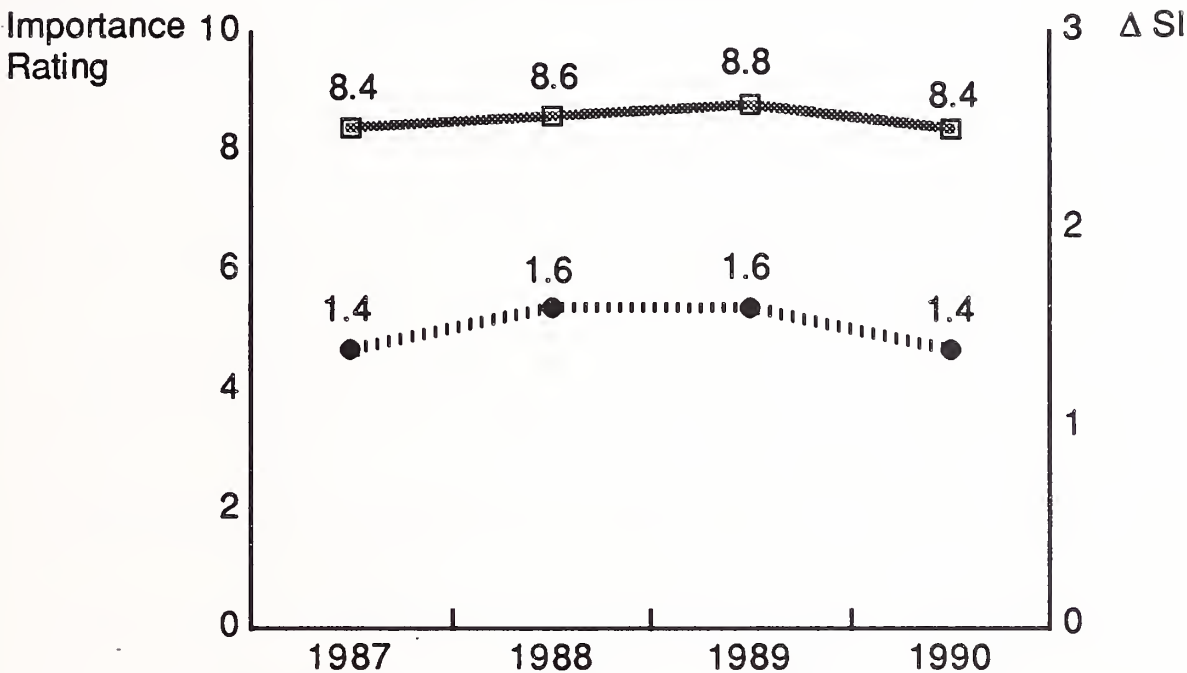
Sample Size: 1987   111
               1988   179
               1989   130
               1990   77

Exhibit VI-12

Systems Software Documentation
Trend Analysis of User Importance Ratings and
Levels of Satisfaction—Wang

Importance 10
Rating

8.7

7.6   7.9

1.8

0.8

2.4

1987   1988   1989   1990

3 Δ SI

━━━━━ Importance Rating

ıııııııııı Δ SI

Sample Size: 1987   59
              1988   200
              1989   —
              1990   82

Note: No data available for 1989

         CE-SV

C
Issues
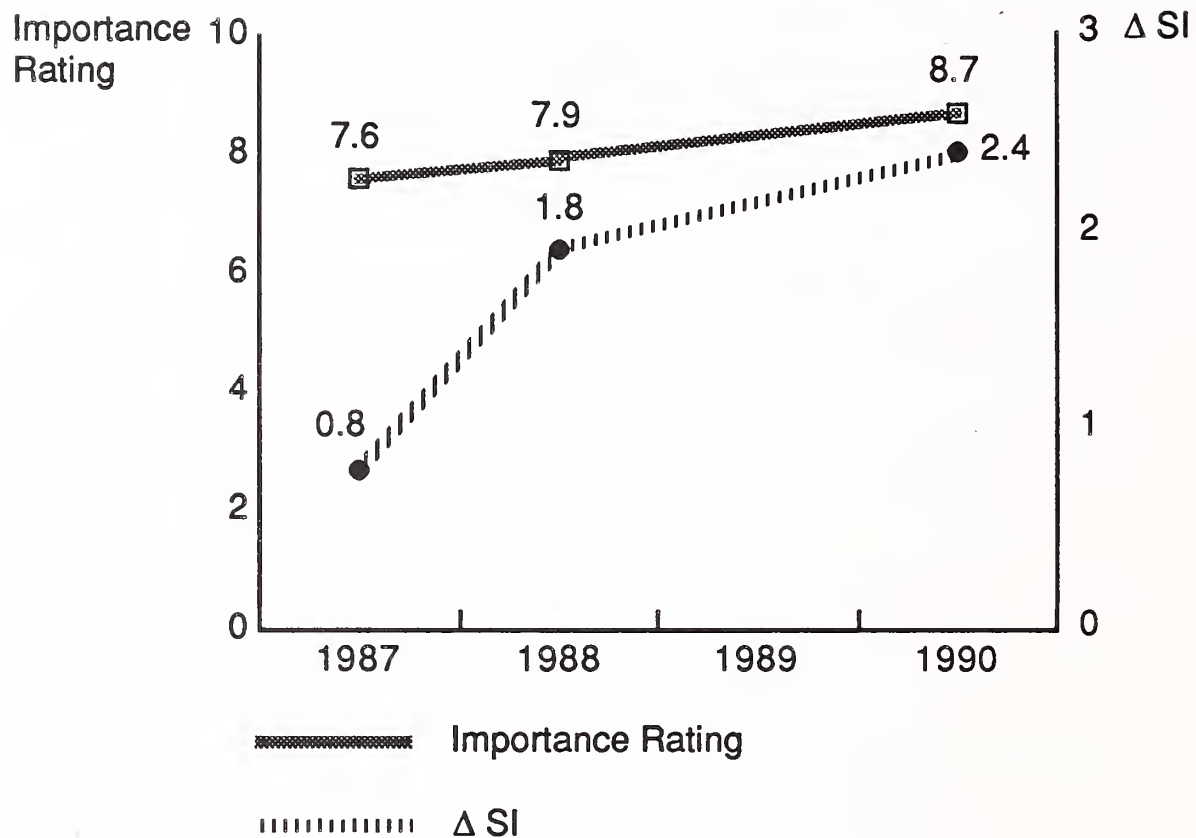
The principal areas of concern with documentation are analysed in Exhibit VI-13. It is worth noting that when asked to comment upon the general level of satisfaction, 66% of respondents claimed to be satisfied. However, on considering the specific causes of dissatisfaction the overall level of satisfaction dropped to 48%. This discrepancy provides further evidence of the dissatisfaction that exists with the quality of documentation supplied.

The major causes of dissatisfaction are analysed below.

1. Problems of Quantity and Comprehension

The basic areas of complaint can be divided into three:-

· The sheer weight of paper supplied is considered to be a significant problem. Support documentation which, in some cases runs into numerous volumes is regarded as unwieldy and difficult to administer.

· The quantity of documentation directly leads to significant problems in locating the required information resulting in a degree of user frustration.

· The problem of language has been quoted as a cause of dissatisfaction. However the research findings are slightly contradictory in this regard. The lack of documentation, both on-line and in document form, in European languages other than English is seen as a problem, but this evidence is contradicted by a number of comments from Continental Europe indicating a preference for documentation in English. It is suggested that a degree of flexibility is required to ensure that documentation is available in a form which will meet the demands of the user.

2. Quality of Service

Two problems were cited as impacting upon the perceived quality of service:

· Users consider that vendors have problems in maintaining documentation at the same release levels as the software it is intended to support

· Complaints have also been voiced at the quality of documentation presentation, particularly when received in the form of poor quality photocopies. Although the provision of documentation in this form may well indicate a concern on the part of the vendor to ensure that users have access to the correct release of documentation, the use of poor quality presentation has a negative impact on the users perception of service quality.

CE-SW1 III - C - VI - 15

Exhibit VI-13

Systems Software Documentation
Causes of Dissatisfaction
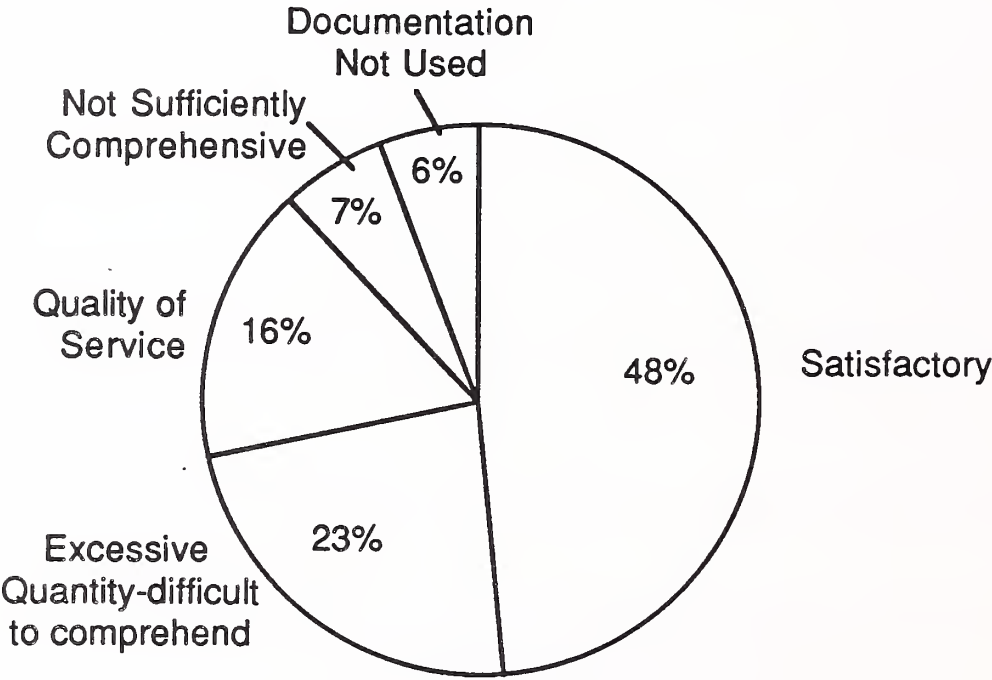
Sample: 30

3. Documentation Not Sufficiently Comprehensive

There is an element of the user community which complains that documentation does not go into sufficient depth. The complaint is made, essentially, by two groups of users. In the first instance, operations staff have observed that documentation consisting of bullet point instructions does not give them a sufficient depth of understanding and secondly, development staff have maintained that the level of systems software documentation supplied does not provide sufficient technical depth to satisfy software development requirements.

The detailed issues raised by users include two seemingly contradictory elements. On the one hand a significant body of opinion suggests that the quantity of documentation supplied is excessive while a number of respondents complain about the lack of detail supplied. On the other hand, users who do not use English as their native language appear to be divided with regard to the merits of receiving documentation in English or their first language.

The key finding from the issues raised by users is that with the possible exception of a dislike of excessive bulk, there is no strong consensus on the major causes of dissatisfaction. The evidence indicates the need to provide a flexible response to the documentation requirements of the user.

D
CD-ROM - A Flexible Response?

CD-ROM is now generally accepted as a viable large capacity storage medium. A number of vendors are currently using, or are about to use, the medium for the distribution of both software updates and documentation. The use of CD-ROM as a distribution and storage medium for documentation can be seen as having a number of advantages.

- The use of a sophisticated text retrieval tool gives the user a vastly improved indexing facility than is possible with documentation provided on paper. This feature obviously negates the problems of locating information from within a vast library of data.

- The fact that CD-ROM can be considered as a high capacity medium offers solutions to two of the problems voiced by users. In the first instance it allows the sheer bulk of documentation to be rendered largely invisible and, secondly, it allows for the possibility of providing documentation in more than one language, thereby increasing the flexibility afforded to the customer.

- The combination of sophisticated text retrieval capacity and a large capacity storage medium permits the provision of documentation aimed at a variety of technical levels within the user community. In addition to satisfying a variety of different technical requirements, the medium opens up the possibility of incorporating products such as computer based training packages into the documentation provided to the user. Such a development would go some way towards satisfying the widely varying demands for technical depth expressed by different groups of users and provides the opportunity to significantly expand the scope of the traditional documentation package.

CE-SW1　　　　　　　　　　III - C - VI - 17

The issues raised point to the need to provide a comprehensive package of documentation which can be delivered rapidly and which is sufficiently flexible to meet the widely varying needs of the customer base. CD-ROM can be seen as possessing both the storage and retrieval capability to meet the expressed needs of the customer. It is currently used, or is planned to be used by a number of vendors and those who fail to utilise the technology will, potentially, put themselves at a competitive disadvantage.

E
Conclusion

Documentation in one of the three issues which is causing significant problems to users, the other two being the provision of software updates and the skills and availability of software support personnel.

Over the past four years, users have consistently rated the quality of documentation at a level of interest of at least 8 on a scale of 0-10 and have expressed a level of dissatisfaction varying between concern and real dissatisfaction. This data firmly indicates that the quality of documentation is of genuine concern to the user community.

Three factors have been identified as causing significant concern.

- Problems are associated with the excessive quantity of documentation supplied coupled with difficulties encountered in comprehending the data. Constituent factors include issues over a lack of adequate language translation and difficulties in indexing the required material.

- The quality of service is perceived to suffer because of difficulties encountered in maintaining documentation at the same release level as the software it supports. Dissatisfaction is also expressed in cases where the quality of presentation has fallen below an acceptable standard.

- Documentation is not considered sufficiently technically detailed to meet the needs of some operations and software development personnel.

It is apparent that the adoption of CD-ROM as a storage technology potentially allows the equipment vendor to address many of the issues which cause dissatisfaction to the customer base. It can, of course, also be considered as providing an additional marketing communications channel already adding further value to the medium.

Although the use of CD-ROM technology provides the obvious tool to tackle the root causes of dissatisfaction, the principal point at issue is that the quality of service provided is failing to meet the requirements of the customer. The key recommendation to be made is to ensure that the product meets the expressed requirements of the user and that the distribution mechanism permits the simultaneous delivery of software and the documentation to support it.

VII

Provision of Software Updates

VII   Provision of Software Updates

A
Introduction

The provision of software updates does not intuitively appear to be a likely cause of significant user dissatisfaction. With the exception of the distribution of modified software to resolve system problems, the introduction of a new release of software does not critically affect the service provided by a computer system to the end user.

It may come as some surprise, therefore, to find that within the general area of systems software support, the provision of software updates is the principal cause of criticism voiced by customers as illustrated in Exhibit VII-1. In addition to the dissatisfaction generated by software updates, it is worth noting that it is an issue that users regard as important. Measured on a scale from 0-10, it averages over 8. It is apparent, therefore that these two factors combined indicate that attention is required on the part of vendors to improve the customers perception of the service they receive.

The purpose of this section is to outline the major points of criticism made by users and to indicate areas in which action might be taken in response to the points raised.

The data for this section is drawn from the body of user research conducted by INPUT over a four year period, supplemented by a series of thirty in-depth interviews conducted with selected users. The purpose of this interview programme was to provide a level of detailed qualitative support to back up the findings of the research data.

Exhibit VII-1

Principal Areas of Dissatisfaction
Provision of Software Update

Provision of Software Updates: 59 | 15 | 26 | 100 — Software Update Issues

Engineer Skills/Availability: 59 | 17 | 24 | 100

Documentation: 66 | 14 | 20 | 100

0   20   40   60   80   100
Percentage of Sample

☐ Dissatisfied
▓ No Comment Made
▨ Satisfied

Sample Size: 30

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B
Trend Analysis
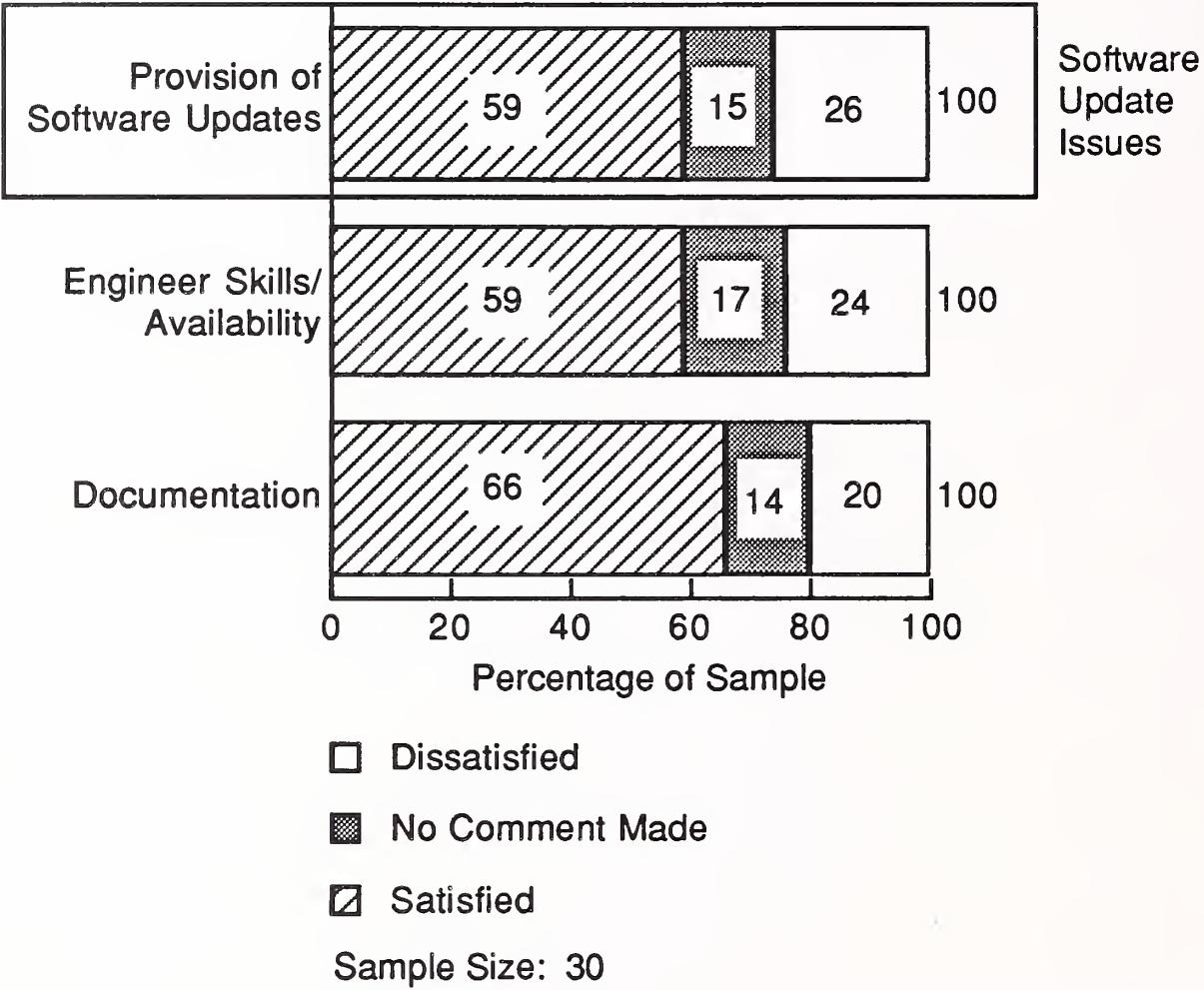
An analysis of the trends in user attitudes towards the provision of systems software updates is presented in Exhibit VII-2. The data is in the form of a weighted average of ten of the leading hardware vendors and the individual company trends are shown in Exhibits VII-3 to VII-12.

Exhibit VII-2 reinforces two key points:

· The average level of importance attached to the issue of software updates by the user community is consistently rated at approximately 8 on a scale of 0-10. Although the subject is not rated as highly as issues such as support skills levels, for example, it is obviously regarded by users as being of significant importance.

· The weighted average levels of satisfaction returned for 1987 and 1988 fall within the range of overall user satisfaction. However, the key point to note is that the trend is worsening and is now showing that a level of user concern exists. It is currently too early to conclude that the levelling of the rate of decline in 1990 marks the beginning of an improving picture or is simply part of a long run continuing problem.

CE-SW1   III - C - VII - 3

Exhibit VII-2

Provision of Software Updates
Trend Analysis of User Importance Ratings
and Levels of Satisfaction—Weighted Average

Importance Rating / ΔSI chart showing years 1987–1990. Importance Rating: 7.9 (1987), 8.3 (1988), 8.2 (1989), 8.4 (1990). ΔSI: 0.4 (1987), 0.8 (1988), 1.0 (1989), 1.0 (1990).

Legend: Importance Rating, ΔSI
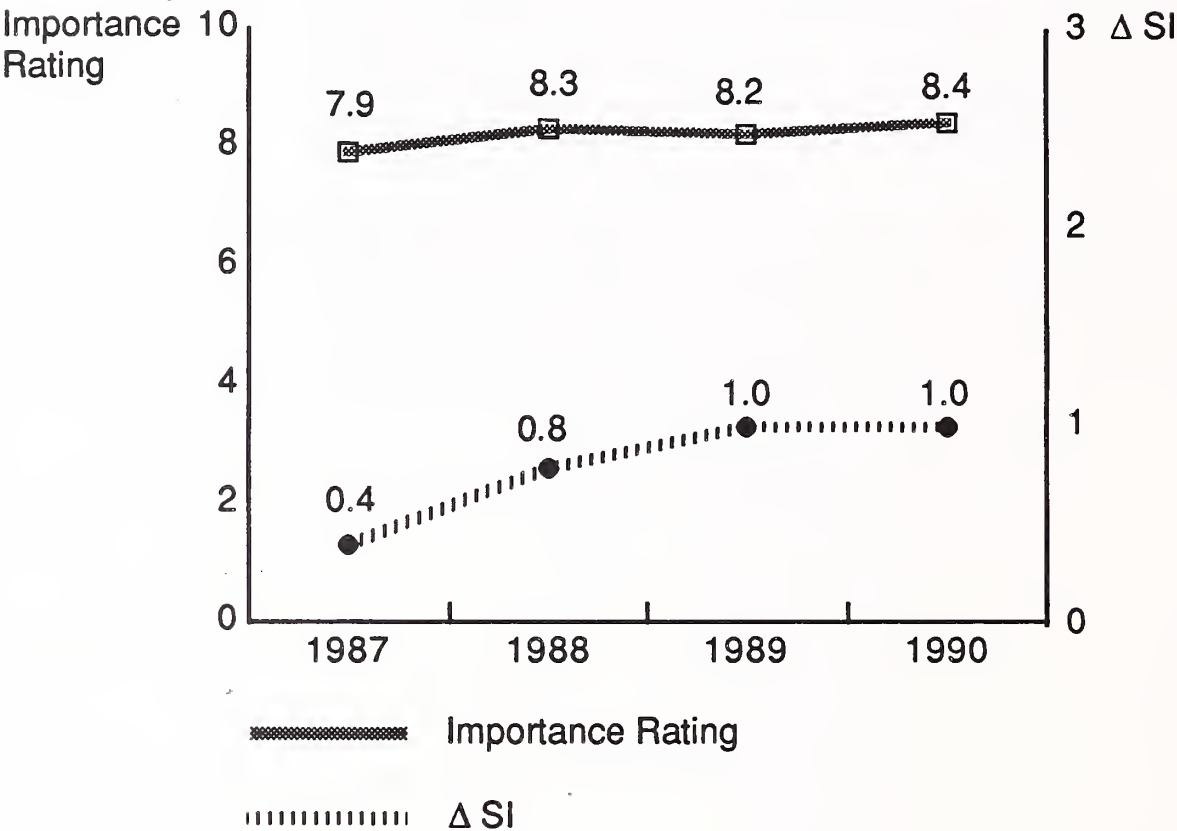
Exhibit VII-3

Provision of Software Updates
Trend Analysis of User Importance Ratings
and Levels of Satisfaction—Amdahl

Importance Rating

Δ SI
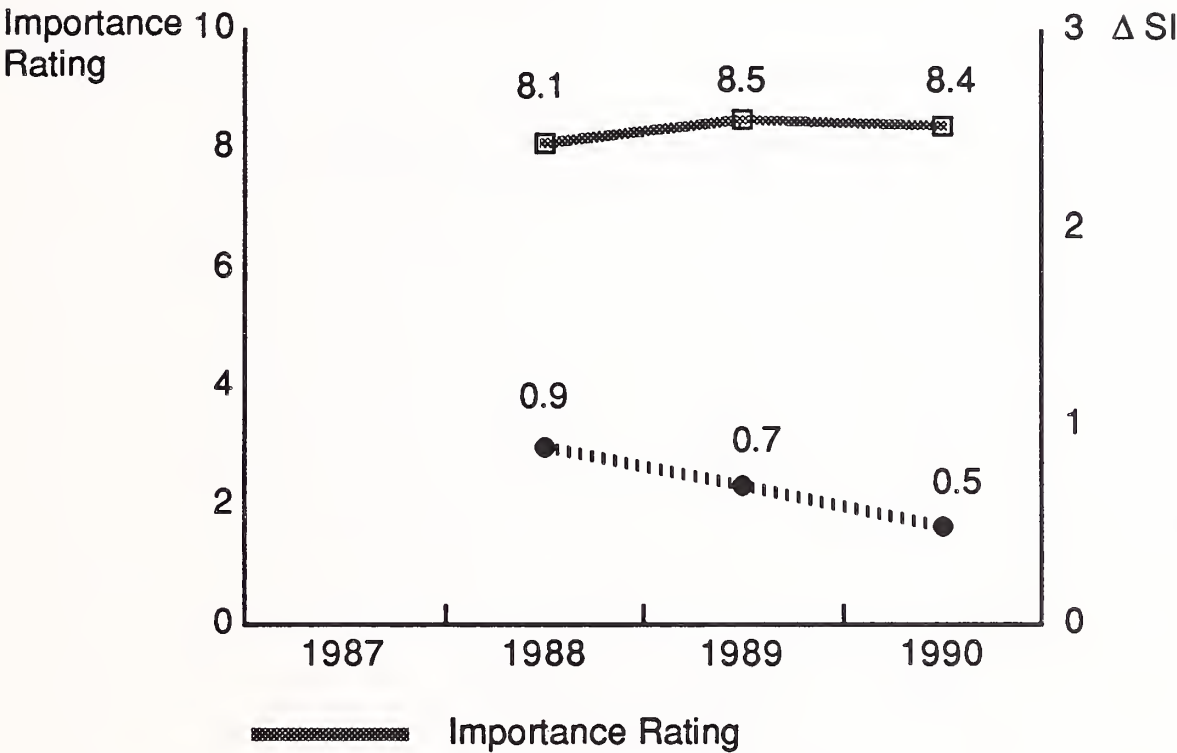
Sample Size: 1987   —
              1988   79
              1989   80
              1990   105

Note: No data available for 1987

Exhibit VII-4

Provision of Software Updates
Trend Analysis of User Importance Ratings
and Levels of Satisfaction—Bull

Importance Rating (left axis, 0–10), Δ SI (right axis, 0–3), by year 1987–1990.

Importance Rating values: 7.9 (1987), 8.3 (1988), 8.0 (1989), 8.2 (1990)

Δ SI values: 0.5 (1987), 0.9 (1988), 1.1 (1989), 1.1 (1990)

▓▓▓▓▓▓▓▓▓▓▓   Importance Rating

ııııııııııı   Δ SI
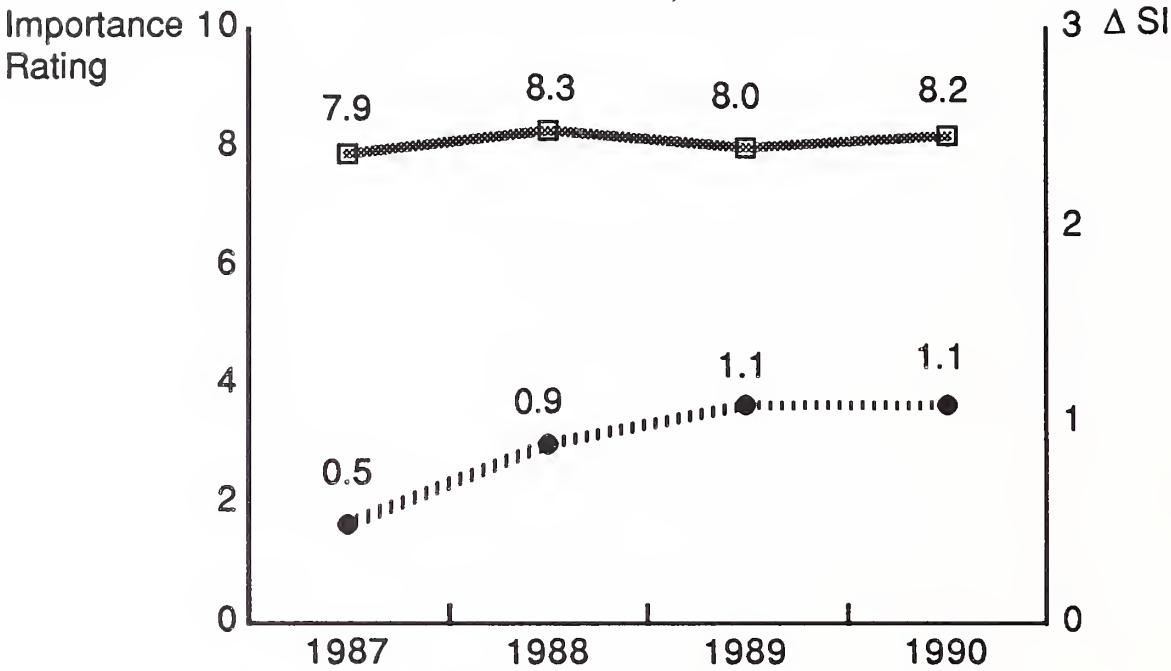
Sample Size: 1987   115
                 1988   146
                 1989   128
                 1990   82

Exhibit VII-5

Provision of Software Updates
Trend Analysis of User Importance Ratings
and Levels of Satisfaction—Digital

Sample Size: 1987   191
                  1988   217
                  1989   134
                  1990   91

Exhibit VII-6

Provision of Software Updates
Trend Analysis of User Importance Ratings
and Levels of Satisfaction—Hewlett-Packard

Importance Rating 10

8.1   8.3   8.3   8.4

3 Δ SI

1.0
0.9
0.7
0.2

1987   1988   1989   1990

▬▬▬ Importance Rating

ııııııııııı Δ SI

Sample Size: 1987   96
1988   109
1989   92
1990   81

Exhibit VII-7

Provision of Software Updates
Trend Analysis of User Importance Ratings
and Levels of Satisfaction—IBM

Importance 10
Rating

8.1   8.5   8.2   8.5

0.5   0.8   0.8   1.1

1987   1988   1989   1990

3 Δ SI

▬▬▬▬▬▬▬   Importance Rating

ııııııııııı   Δ SI

Sample Size: 1987   210
                1988   237
                1989   254
                1990   257

Exhibit VII-8

Provision of Software Updates
Trend Analysis of User Importance Ratings
and Levels of Satisfaction—ICL

Importance 10   3 Δ SI
Rating

        8.2   8.2   8.0
7.6

8   2

        1.6

6

                                          1.0
        0.8

4   1

0.2

2

0   0
  1987   1988   1989   1990

▬▬▬▬▬▬   Importance Rating

ııııııııııı   Δ SI

Sample Size: 1987   197
               1988   203
               1989   185
               1990   198

                   CE-SW1

Exhibit VII-9

Provision of Software Updates
Trend Analysis of User Importance Ratings
and Levels of Satisfaction—NCR

Importance Rating

Sample Size:
1987	121
1988	88
1989	61
1990	36

Exhibit VII-10

Provision of Software Updates
Trend Analysis of User Importance Ratings
and Levels of Satisfaction—Siemens

Importance Rating

Sample Size:	1987	53
	1988	31
	1989	49
	1990	25

Exhibit VII-11

Provision of Software Updates
Trend Analysis of User Importance Ratings
and Levels of Satisfaction—Unisys

Importance 10   3 Δ SI
Rating

8.1   8.4   8.3   8.5

8

6

4   1.1

0.8   0.9   0.9

2

0   0
   1987   1988   1989   1990

▬▬▬▬▬▬▬▬   Importance Rating

ıııııııııııı   Δ SI
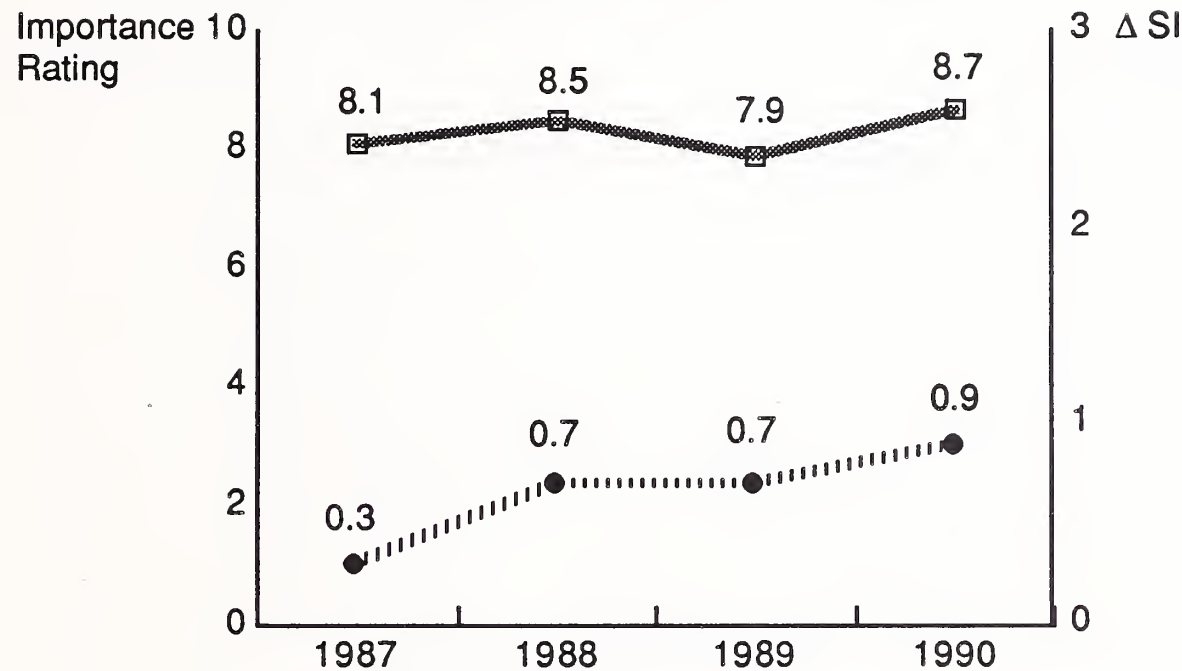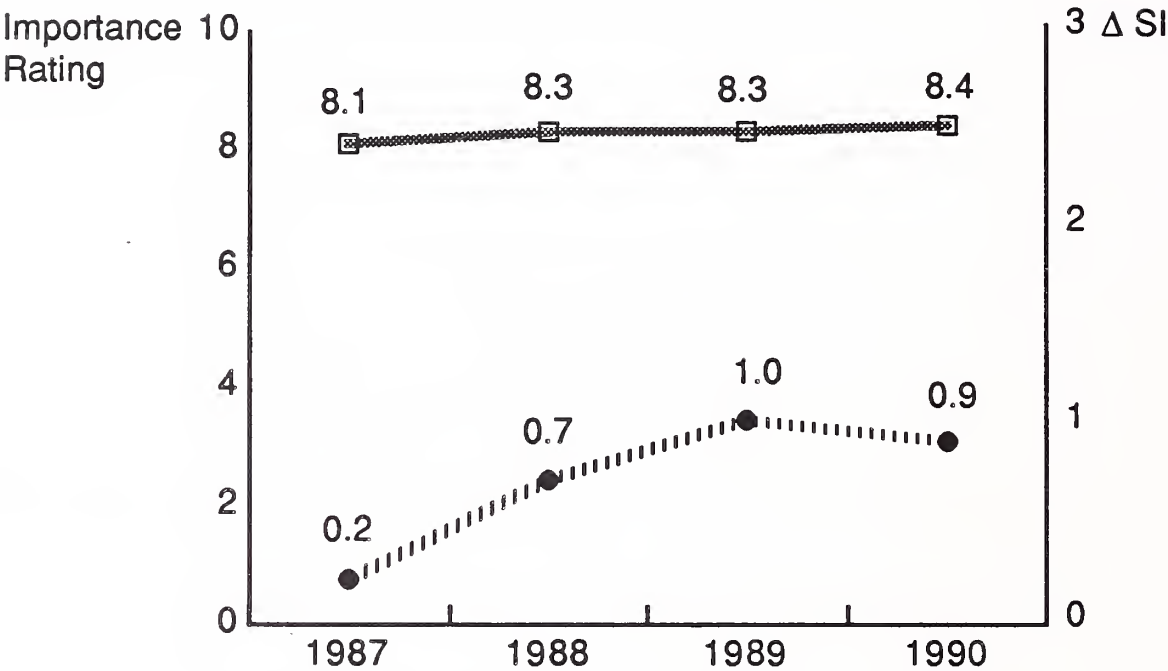
Sample Size: 1987   111
               1988   179
               1989   130
               1990   77

Exhibit VII-12

Provision of Software Updates
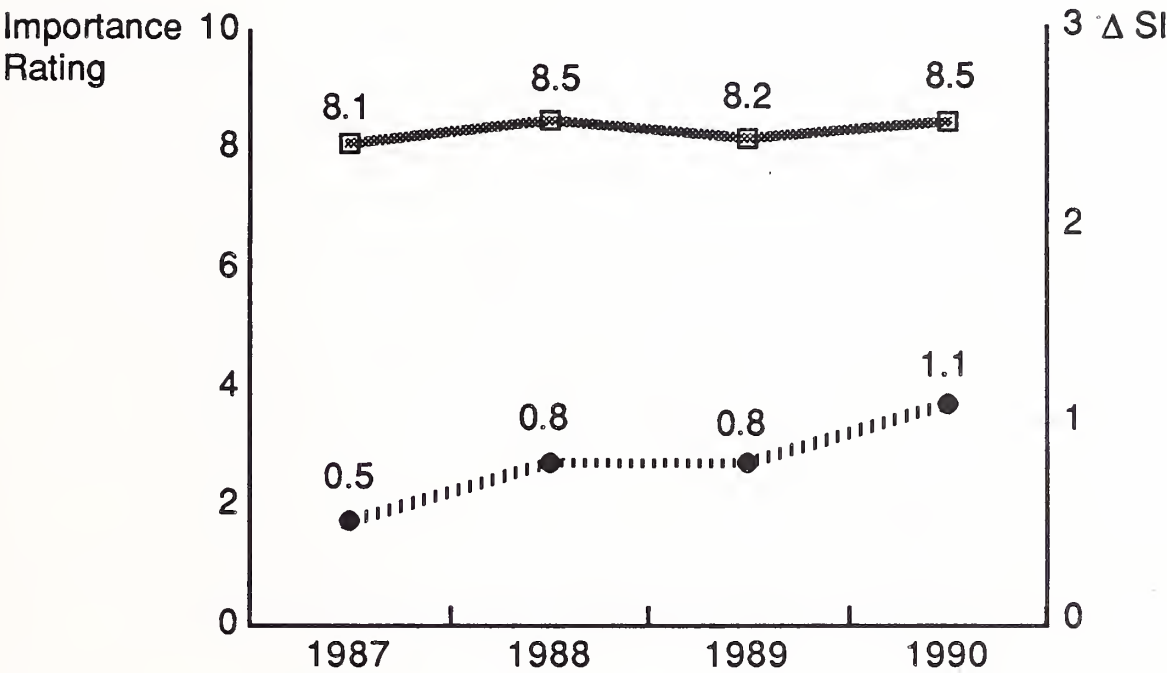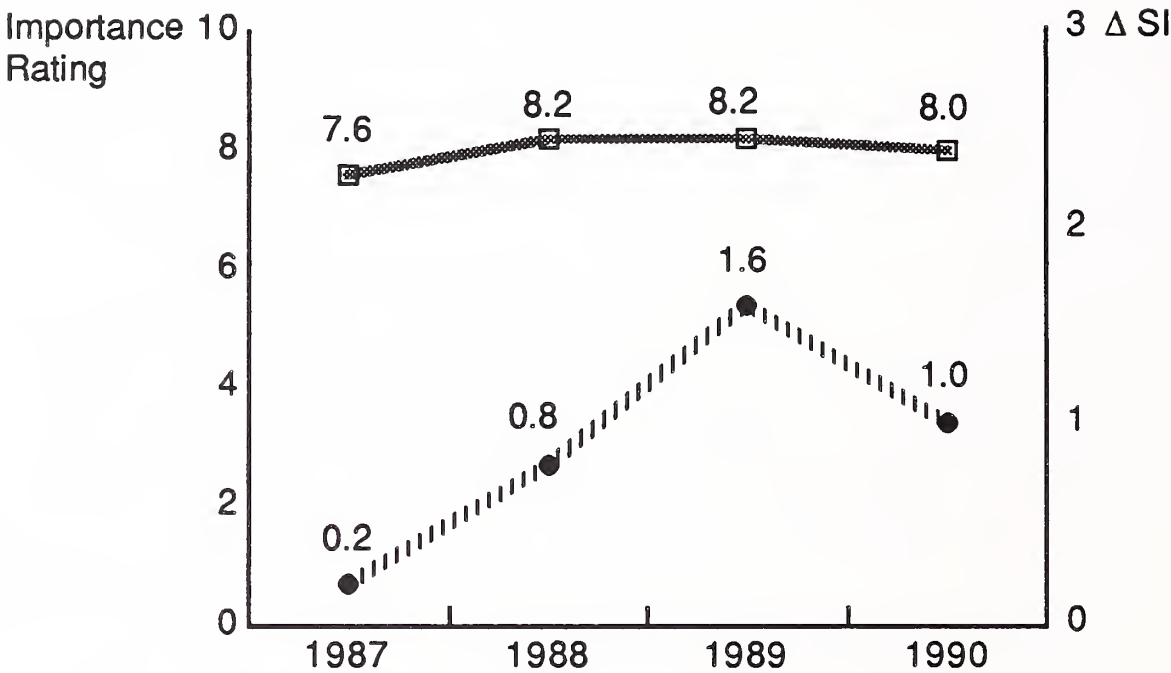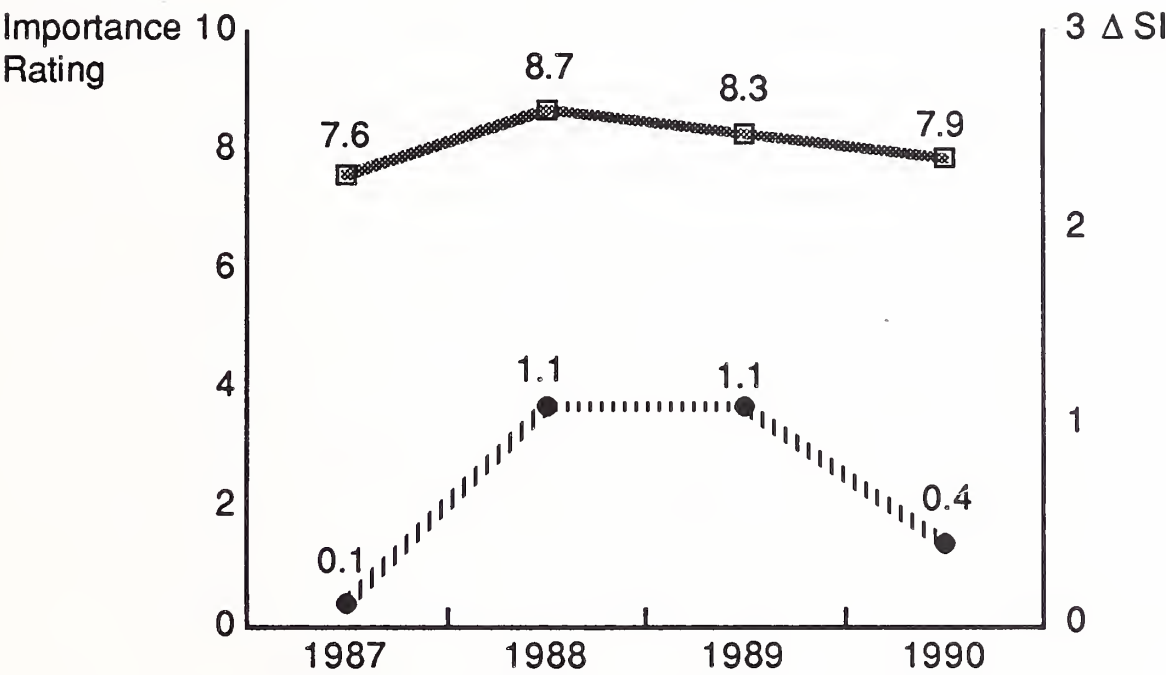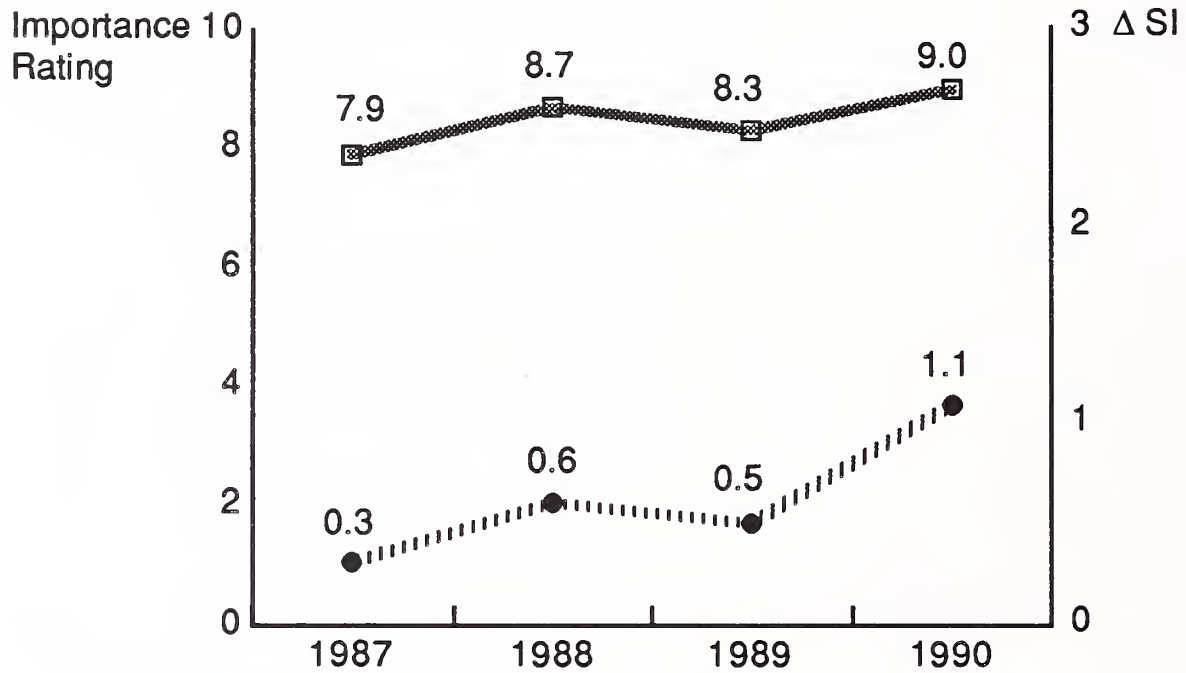# Trend Analysis of User Importance Ratings
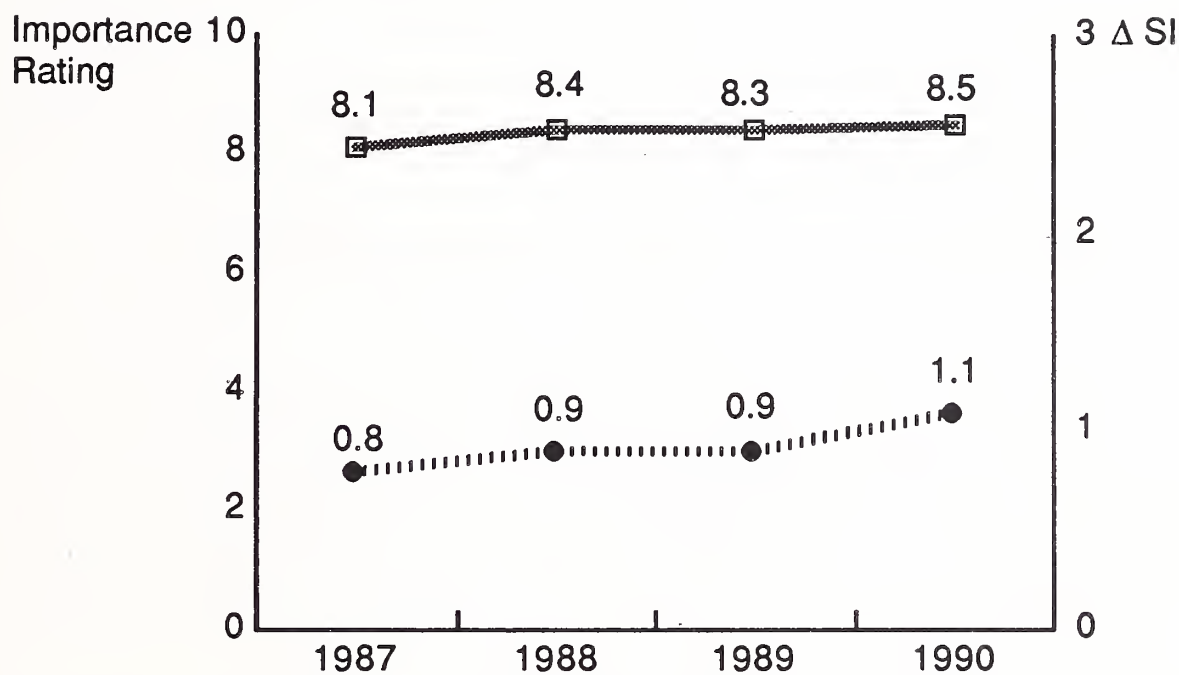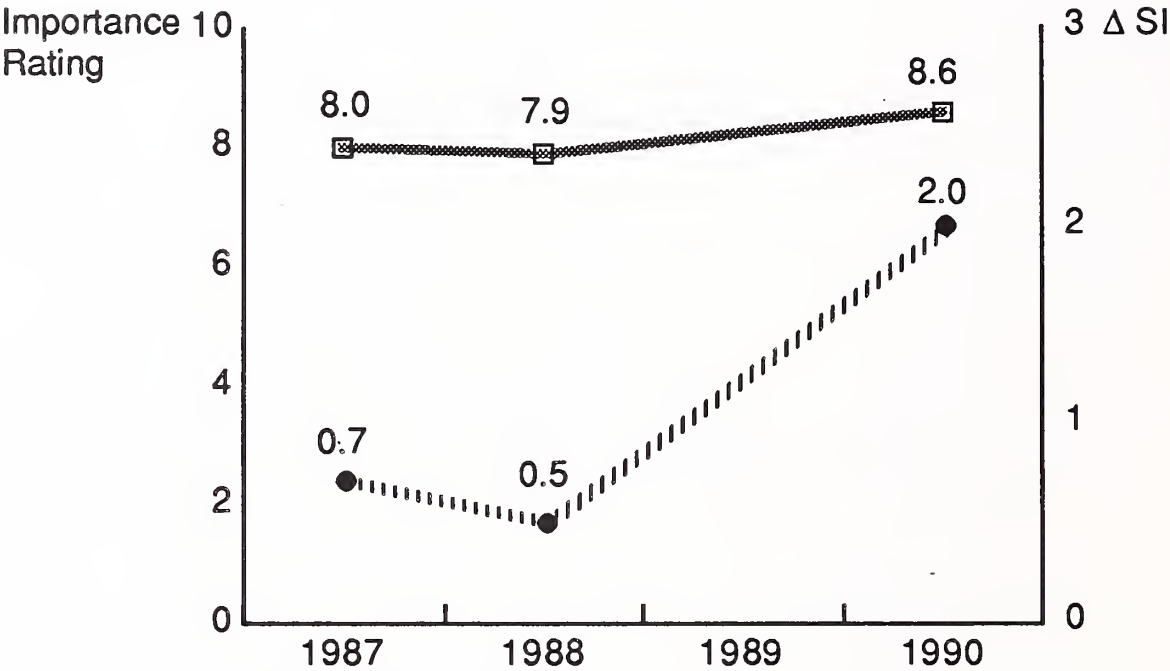# and Levels of Satisfaction—Wang

Importance Rating

Δ SI

Sample Size: 1987   59
             1988   200
             1989   —
             1990   72

Note: No data available for 1989

 CE-SW1

C
Issues

The principal areas of concern with the provision of system software updates are illustrated in Exhibit VII-13.

The two major causes of dissatisfaction, the slow delivery of updates and a variety of miscellaneous problems, are analysed below:

1. The Slow Delivery of Updates

The biggest single issue of concern to users is the delay experienced in receiving both copies of new software updates and information related to the availability of software. The comments made by users on this issue can essentially be broken down into three.

· Concern is expressed both at the delays experienced in receiving updated software products and the difficulties inherent in maintaining current knowledge of the release status of software.

· The quality of information provided on the release status of software is not regarded highly. Respondents have commented on the "sketchy" nature of the information supplied and on the lack of comprehensive technical documentation relating to update issues. Users complain that the documentation is not sufficiently comprehensive to allow them to load the software without assistance and that inadequate information is supplied on issues relating to problems of compatibility between different software releases.

· Customers have also expressed dissatisfaction in cases where the policy concerning the responsibility for loading software is confused. In addition to the inevitable delays that will be caused by such uncertainties, the confusion and irritation that can be generated by a lack of procedural clarity is an obvious source of potential dissatisfaction.

Exhibit VII-14 lists some examples of comments made by users concerning the delays experienced in obtaining updates and related information.

2. Miscellaneous Problems

Problems categorised as miscellaneous collectively comprise the largest source of dissatisfaction with the provision of software updates. It is obviously not practical to draw specific inferences from a wide variety of different responses. However the listing of some of the comments made by users provided in Exhibit VII-15 offers some indication of the various issues raised by customers.

Exhibit VII-13

The Provision of Systems Software Support
Causes of Dissatisfaction

Do Their Own
2%

Provided by
3rd Party

No Comment

4%

10%

Slow Delivery
of Updates

10%

59%

Satisfactory

Miscellaneous
Problems

14%

        CE-SW1
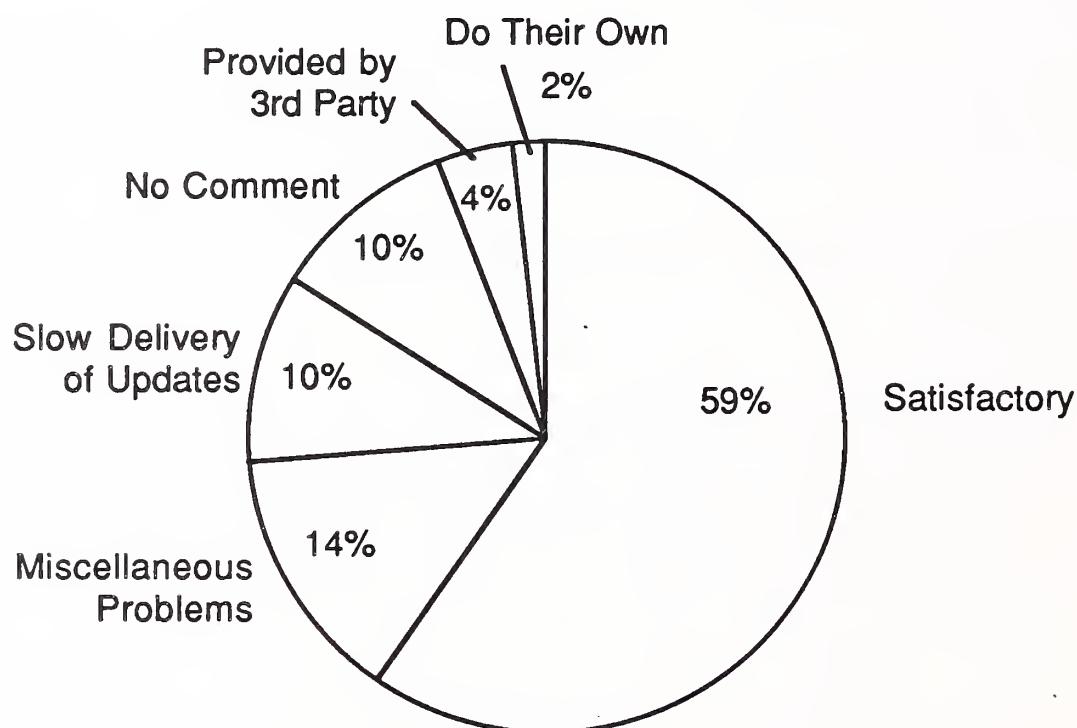
Exhibit VII-14

The Provision of Software Updates
Selection of User Comments Relating
to the Slow Delivery of Updates

- News of new releases is slow—delivery is also slow

- Poor—user is not informed of availability. It is difficult to get the vendor to load it and the documentation is not good enough to load it from the book.

- By request only—not automatic. More notice of changes required.

- Do their own. Cases of backward compatibility not documented.

Exhibit VII-15

The Provision of Software Updates
Selection of User Comments Relating to
Miscellaneous Problems

- Causing problems—vendor is pushing for an upgrade. The customer is unwilling to move.

- Quality of information is poor, sketchy and uncoordinated.

- Do not trust updates. There are too many bugs.

- Not happy because updating of software doesn't happen. Support for software is withdrawn too soon.

     CE-SW1

D
Tactical Improvements

The overall conclusion to be drawn from the issues raised by users is that the basic cause of most of the problems is the perceived lack of communication between the vendor and the customer. Such a finding might appear to be somewhat surprising when it is considered that a number of vendors publish regular technical information as part of the total software support product. Nevertheless, the research findings clearly indicate the need to ensure that the channels of information that the customer expects are effective.

Although it is possible to suggest a number of specific tactics which might have some impact on the perceived shortfalls in this specific area, such as, for example, the introduction of CD-ROM to provide a standard distribution mechanism for both software and related documentation, it is likely that such programmes will only have a limited affect on the perception of the customer. The principal point to be drawn from the research findings is that, in the case of this particular issue, the quality of account management is not meeting the expectation of the user. It is suggested that, if the increasing levels of dissatisfaction evident in the trend data are to be reversed, attention should be focussed on ensuring that the channels of communication relating to update information are in place, are understood and, most importantly, meet the needs of the customer. In this context it is worth re-iterating the point that users are attaching a considerable degree of importance to the issue of software updates and that a rising level of dissatisfaction provides cause for concern

E
Conclusions

The issue of the provision of systems software updates is regarded as being of significant importance by users. It is rated at a level of interest of approximately 8 on a scale of 0-10.

The level of satisfaction generated by the issue has shown a declining trend over the 4 year period to 1990 and is at a level where it is giving cause for concern.

The principal issue is the perceived delay experienced by users in receiving both new releases of software and information relating to release status.

A number of miscellaneous points were raised by customers which cannot be categorised into specific complaints.

The overall conclusion to be drawn from the study is that, in relation to this specific subject area, the quality of account management does not meet the requirements of the customer.

If the declining levels of satisfaction evident in the trend data are to be reversed, vendors should ensure that communication and distribution channels are effective and both widely accepted and understood.

Appendixes

Appendix A

User Questionnaire Addition for InDepth User Interviews

1. What do you consider to be the major contentions or issues related to the service you receive on your computer system?

    Hardware Service

    _____

    _____

    _____

    Software Support

    _____

    _____

    _____

2. What do you consider to be the major strengths and weaknesses of your service vendor?

    _____

    _____

    _____

3. Has the level of service you receive improved or degraded over the last 3 years?

    _____

    _____

    _____

4. What are your comments related to your service vendor's capability in the following aspects of service performance?

1. Hardware Service

Spares Availability

_____

_____

_____

Engineering Skills

_____

_____

_____

Problem Escalation

_____

_____

_____

Documentation

_____

_____

_____

Remote Diagnostics

_____

_____

_____

2.   Systems Software Support

Engineer Skills

_____

_____

_____

Documentation

_____

_____

_____

Software Installation

_____

_____

_____

Provision of Systems Software Updates

_____

_____

_____

Remote Diagnostics

_____

_____

_____

5.   Do you feel that your service vendor provides the quality of service you require? What comments would you make related to quality of service and the responsiveness of your service vendor to your specific needs?

     _____

     _____

     _____

6.   How would you prefer your service vendor's approach to providing a wider range of services (other than maintenance systems software support) to be developed, and would you welcome the availability of a wider range of services?

     _____

     _____

     _____

Appendix B

Software Support Issues Questionnaire - Vendors

This questionnaire is intended to assist **INPUT** in identifying the issues currently facing systems software support. The findings from these interviews will be incorporated into the 1991 *Systems Software Support Issues Report* which forms part of the 1991 customer services programme.

Pricing/Bundling Issues

1. Do you bundle any or all of your systems software support into the systems software licence fee?

    Y / N

2. If yes, what components of the systems software are bundled?

    · Operating system

    · Networking Software

    · Performance Monitoring Tools

    · DBMS's

    · Other

3. What are the principal reasons behind your decision to bundle/unbundle?

    _____

    _____

    _____

4. Do you consider that the bundling of software support provides a defence against competitive pressures from third party vendors and if so, how much?

    _____

    _____

    _____

CE-SW1 III - C - B - 1

5.   PCM's only

     How is systems software support charged on IBM systems software resident on PCM's hardware?

_____

_____

_____

Skills Issues

(Users have reported concern with the availability and responsiveness of appropriately qualified staff.)

6.   How is software support delivered?

     •   Head office telephone help-line   Y / N

     •   Through the standard hardware engineering channel   Y / N

     •   Through a dedicated field software support function   Y / N

     •   Through the escalation procedure   Y / N

7.   How are software calls handled?

     •   Through the hardware call logging procedure   Y / N

     •   Through a parallel software call logging procedure   Y / N

     •   Escalated as a result of a hardware call   Y / N

(Policy Re-on-going support for obsolete products)

Documentation Issues

8.   What types of documentation do you issues as part of your software support?

- Manuals   Y / N

- Release Notices   Y / N

- Problem Databases   Y / N

- Misc advice/Q & A   Y / N

- Other   Y / N

9.   Which mode of delivery do you use?

- Paper   Y / N

- CD-ROM   Y / N

- On-line Access   Y / N

- Other   Y / N

Provision of Software Updates?

10.   How are systems software updates sold?

- By subscription to software service contracts   Y / N

- Bundled with the licence fee   Y / N

- By individual order   Y / N

- Other   Y / N

11.   How are systems software updates delivered?

      ·   On magnetic media   Y / N

      ·   CD-Rom   Y / N

      ·   Telecommunications Link   Y / N

      ·   Via dealers   Y / N

      ·   Other   Y / N

12.   Who is responsible for the installation of systems software updates?

      ·   The vendor   Y / N

      ·   The customer   Y / N

      ·   The dealer   Y / N

      ·   Other   Y / N